1998 Seminar Tour

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3/25	Washington, DC
4/7	Atlanta, GA
4/8	Dallas, TX

Presenter
Beth Gage
TeleChoice, Inc.

NetworkWorld
TECHNICAL SEMINARS

High Speed Remote Access Solutions with xDSL

Seminar Overview

xDSL has fast captured the networking community's interest as a possible solution to the throughput bottlenecks that plague today's access networks. xDSL holds tremendous potential for providing high speed network access but like any new technology, there are potential pitfalls. There is also a strong business case for xDSL in certain environments. The key is knowing when and what type of xDSL to deploy, and how this emerging family of technologies fits into present remote access strategies.

High Speed Remote Access Solutions with xDSL will assist service providers, network managers, system integrators and end users in the assessment of this revolutionary new broadband access technology. This one-day seminar is taught by leading xDSL consultant Beth Gage of TeleChoice, Inc. The seminar will provide a thorough analysis of the emerging xDSL technologies and how they compare to existing remote access solutions like ISDN and analog dial-up.

In addition you will learn the differences between each of the xDSL offerings, which applications they support and when they may be available in various service areas. Find out how xDSL differs from today's remote access service offerings and which xDSL-enabled services will be offered first and from whom.

High Speed Remote Access Solutions with xDSL will provide you with the facts necessary to evaluate xDSL and make informed decisions on service offerings, integration and implementation.

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1. Learn the xDSL basics and how to match the different technologies to new and emerging applications.
2. Understand the differences between xDSL and access solutions such as 56k modems, T1, ISDN BRI and PRI, and learn how they will co-exist in the marketplace.
3. Analyze the benefits and limitations of using transport technologies such as ATM and Frame Relay with xDSL.
4. Explore how xDSL products differ and which to choose for your application.
5. Learn how the xDSL market is going to grow globally and at what rate.
6. Look at the business case for xDSL: which service offerings provide the best bandwidth for the buck and when does it make sense to migrate from traditional services to xDSL.
7. Review service offerings that are available today and learn how network managers are using xDSL to meet their company needs.
8. Understand how xDSL affects the Customer Premises — what are special wiring requirements, CPE functionality and form factors.
9. Learn the steps for deployment, how to contact a service provider, negotiate service contracts and if service level agreements are available.
10. Review the top 10 questions to ask a service provider about xDSL services.
11. Explore what new and future product enhancements will further the case for xDSL.
12. Discover what drivers may ensure xDSL's success and what potential deployment obstacles may slow its advent.

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TURN TO INSIDE BACK COVER

SECTION 1
DSL Introduction

As with any evolving technology, learning how xDSL works and what its different implementations are capable of is a challenging task. This section will describe each xDSL technology and explain how and where it is being used today.

a. How xDSL Works and How It Differs from Traditional Access Methods
- Dedicated vs. Dynamic
- Packet Switched vs. Circuit Switched
- Cost
- Speed
- Availability
- Management
- Productivity

b. Brief Comparison with Competing Next Generation Local Loop Access Approaches
- Cable Modems
- LMDS/MMDS
- DirecPC
- Other Satellite Dfferings

c. Review of Various DSL Types and Their Capabilities
- R/ADSL
- IDSL
- HDSL
- S-HDSL/SDSL
- HDSL2
- VDSL
- Lite Versions

d. Matching DSL Types and Capabilities to Applications. Which transport protocols fit with which DSL type?
- Telecommuting
- LAN Interconnect
- Internet/Web Access
- Video Dn Demand
- Videoconferencing
- Vertical Applications (Prepress, Distance Learning, Health Care)

e. Projections of xDSL development for US, Europe, Asia and South America
- How many lines will be deployed by service providers in coming years?

f. Drivers for today's xDSL markets. What factors will affect widespread deployment? Why will xDSL succeed as a service offering and what benefits does it offer corporate network managers that currently rely on other access methods? Which xDSL solutions will be adopted first by service providers?

g. Potential Obstacles for Deployment
- Loop Infrastructure Improvements
- Lack of Billing and Management Software
- Regulatory Issues

h. Review of Services and Trials
- What is available now and what services will be launched in the next year?
- Where has xDSL been successfully deployed and why?

Case Study: Review of a network using xDSL for WAN connectivity needs and the benefits realized in terms of performance, cost and productivity. What costs are involved and how long it takes to get up and running.

SECTION 2
Network Integration Issues

a. How Will Current Data Communications CPE Support xDSL?

b. How to Successfully Migrate Users from Traditional Access Approaches to xDSL

c. Equipment Options
- Hybrid Modems
- xDSL "CSUs"
- New xDSL Branch Office Routers
- xDSL Access Concentrators

d. Customer Premises Equipment Requirements
- Forms and Factors Interfaces Supported
- POTS Splitter Location
- Inside Wiring Types
- Equipment Cost and Cost of Ownership
- Protocol Support
- Port Density
- Line Code Support

e. Service Deployment Scenarios
- Central Office Scenario
- Digital Loop Carrier Scenario
- Dry or Unconditioned Wire Scenario
- ISP DSL Implementation

f. Important Attributes in a Service Provider
- Determining Coverage Area
- Successfully Performing Loop Qualifications
- Determining Installation Costs and Time
- The Differences Between an Incumbent and CLEC

Case Study: Examine one CLECs investment with xDSL from equipment testing, to platform selection and service launch. Learn what makes a service successful and reliable and what doesn't.

SECTION 3
DSL: Complimentary or Competitive?

a. Today's service providers and network managers alike are faced with as many choices in the WAN as they have in the LAN. Determining what type of xDSL will be used and its integration into current networking strategies is critical to a successful service.
- Comparing xDSL to Today's Options (ISDN, 56k analog, 56k digital, etc.) in terms of cost, availability and performance
- Matching xDSL Access Technologies to User Needs and Applications
- Comparison with other next generation access technologies like cable modems, satellite and fiber
- Evaluating equipment requirements: Does your current equipment present a migration path or force a forklift upgrade?

SECTION 4
Multiservice Network Issues

Selecting a xDSL transport is one matter; determining which transport protocols will be used to enable it is quite another issue. This section will outline what options are available for xDSL and the benefits and drawbacks of using each.

a. Selecting the Backbone Network — Assessing Reliability and Scalability
- Router or IP networks
- Frame Relay
- ATM

b. Requirements for a Multiservice Provider Environment
- Application Requirements
- Marketing Strategy
- Network Requirements
- SVCs
- QoS
- Billing Support
- Customer Service Support

SECTION 5
Value Added Services

Because xDSL is just a physical transport, much of its success is dependent on the applications that are deployed over it. As a dedicated access medium, xDSL enables a new suite of services providers and, consequently, end users. This section identifies which applications are best suited to xDSL and how they can be successfully implemented.

These include:
- Managed Network Services
- Native LAN Services
- Voice over Frame Relay
- Access to Intranets/Internet
- Internet Push Applications
- Interactive Gaming
- On-Line Commerce

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❑	March 12	New York, NY	Grand Hyatt
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❑	March 25	Washington, DC	Radisson Plaza Hotel
❑	April 7	Atlanta, GA	Renaissance Waverly
❑	April 8	Dallas, TX	Infomart

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About the Seminar Presenter . . .

BETH GAGE is TeleChoice's senior consultant in one of the world's major hotspots for new technologies — access bandwidth. Gage is known as an authority on copper enhancement technologies, including all the xDSL products, services and applications. Gage regularly consults with the world's carriers and equipment providers about the role of new broadband technologies including xDSL, frame relay and ATM in their strategic and tactical product portfolios. Through her work with clients, she has assisted service providers with developing and launching new services both domestically and internationally. Gage has also assisted many equipment vendors with their product development and marketing plans.

TeleChoice issues the monthly *TeleChoice Report on xDSL*, through which the firm has been directing the industry's consciousness of one of the most impacting technologies to hit telecommunications in recent years. In conjunction with *tele.com* Magazine and McGraw-Hill's National Software Testing Laboratories, TeleChoice conducted the industry's first published test of xDSL modems. Other pieces on the latest xDSL technologies have been published by TeleChoice consultants in *Network World* in addition to TeleChoice's own Report on xDSL. TeleChoice is the most quoted firm on access bandwidth issues in trade press and in national publications like *USA Today* and *Business Week*.

FEBRUARY 2, 1998 VOLUME 15, NUMBER 5

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

AP PHOTO

Showtime

ComNet '98: Politics and networks share the spotlight.

By Network World staff

A cornucopia of new network technologies spilled forth from the more than 500 exhibitors at last week's ComNet '98 conference, but it was politics that stole this 20th anniversary edition of the show.

Sure, Internet luminaries such as MCI Communications Corp.'s Vinton Cerf and Marimba, Inc. CEO Kim Polese graced the keynote podiums; Internet stations dotted the Washington, D.C. Convention Center's corridors; and upstarts such as Berkeley Networks, Inc. showed off radical new routing switches.

But this show – held within spitting distance of Capitol Hill on this most hectic of weeks for the Clinton administration – was more about taking shots at the Federal

See ComNet, *page 55*

COMNET COMPLETE

Stories inside:

US WEST **A DSL house divided. Page 6.**

Newbridge ditches UB. Page 10.

Management vendors scrap. Page 14.

ISDN STINKS

...and anecdotes galore. Page 55.

STAN BAROUH

Windows-based Terminals need speed work

By John Cox
Redmond, Wash.

Beta testers of Microsoft Corp.'s Windows-based Terminal (WBT) Server now know at least one thing about the protocol that links desktop clients to server applications.

It's slow.

More precisely, the first beta of Remote Desktop Protocol (RDP) is substantially more sluggish over a WAN than the comparable protocol from Microsoft development partner Citrix Systems, Inc., according to several beta users interviewed by *Network World*.

Unless Microsoft can make good on its promise to boost RDP's speed, the newfangled Windows-based Terminals, which will access applications running on the WBT Server, could turn into expensive paperweights.

See **WBT,** *page 56*

Get more online:

- **Details of the RDP protocol, including a primer from Databeam**
- **Articles on the Windows-based Terminal Server**

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Digital CEO *Robert Palmer (left) and Compaq CEO Eckhard Pfeiffer break the news abont Compaq's planned acquisition.*

STEVE BORNS

Compaq ends Digital era

By Christine Burns and Marc Songini
New York

What can $9.6 billion get you these days?

Last week it bought Compaq Computer Corp. some much needed respect with enterprise customers when the PC vendor agreed to pay that price for Digital Equipment Corp. Those billions also bought Compaq a major-league service and support organization and a boatload of new hardware and software.

Once a supplier of desktop-to-data center systems second only to IBM, Digital more recently has become better known for its service and support organization.

The division employs more than 15,000 people and generates $6 billion in revenue annually. It keeps existing VAX and Alpha-based machines up and running and has been dubbed the leading Windows NT systems integrator by Microsoft Corp. (see story, page 17).

While enterprise service and support is the single biggest draw for Compaq, which previously did not have a large-scale services arm, the computer giant also picks up a slew of Digital's

See **Digital deal,** *page 15*

OpenView gets Java face

By Jim Duffy

For OpenView users, the wait for Java support will end this summer.

That is when Hewlett-Packard Co. will ship a Java-based user interface for OpenView's Network Node Manager (NNM), a feature long wanted by HP customers (*NW*, June 23, 1997, page 1). HP quietly demonstrated the new graphical user

See **HP,** *page 56*

COMNET

Anatomy of a friendly Hack

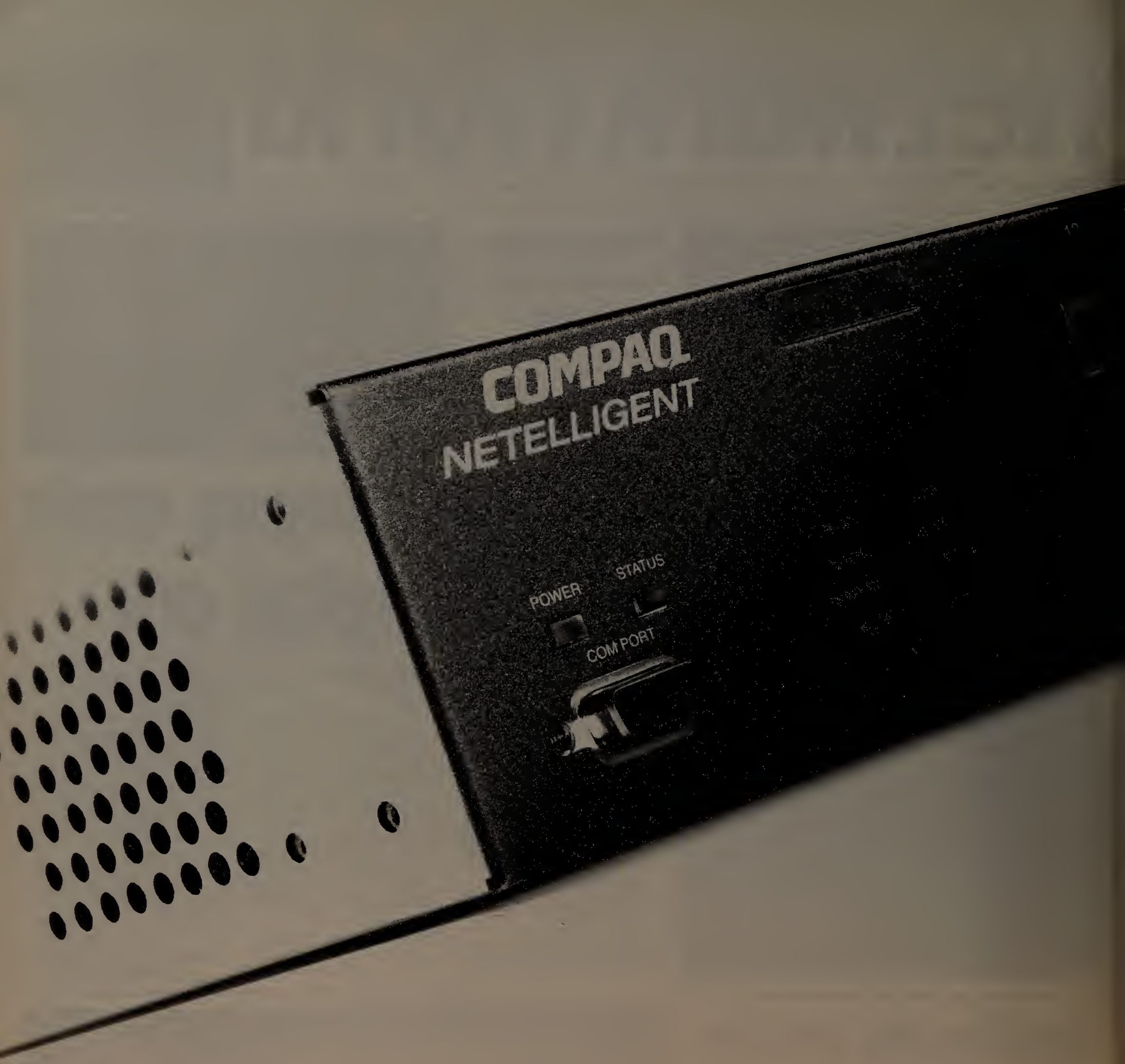
How to assess your enterprise security and thwart attacks.

If you want to know how secure your Web site really is, there's a sure way to find out: Hire a hacker to break in.

The strategy paid big dividends for a financial institution that was about to launch Web-based banking services. It hired a security assessment team that identified network vulnerabilities and told the bank how to fix them before the rollout, helping to reduce the risk of electronic embezzlers making off with someone else's cash.

Turn to page 35 for a firsthand account of the simulated attack. You'll also find practical tips for shoring up your Web and enterprise security.

MARCOS SORENSEN



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SOMETHING TO CROWE ABOUT

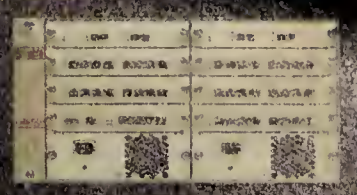
Level 3 chief spends $3 billion on a better 'Net. Page 23.

NO FUSS, NO MUSS

Columnist James Kobielus examines the ingredients of a properly mixed EDI and Web-based electronic commerce world. Page 33.

JOIN THE CLUB

Cabletron enters the routing fray with its new SmartSwitch family. Page 11.



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February 2, 1998 Volume 15, Number 5

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Securing the Web

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10 ways to protect your Web commerce sites. Page 36.

10 low-cost ways to strengthen your internal security. Page 37.

Five basic security necessities. Page 40.

10 ways to maintain security vigilance. Page 41.

REVIEW: *MediaOne Express' cable modem and service package leaves analog modems and ISDN in the dust.* Page 42.

MARCOS SORENSEN

SPECIAL FOCUS

Thin-client net impact

Thin-client desktops may force network infrastructure changes. Page 20.

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This Week

Only on Fusion

Keeping Current. Many companies announced products and services at ComNet '98 last week. But what was the one announcement with the most impact, the one most likely to really shake things up? Fred McClimans tells you. **DocFinder: 5625**

ComNet. And if you missed the show, come online for complete wrap-ups of all the keynotes, special sessions and breaking news. **DocFinder: 5621**

The government vs. Microsoft. Should the government butt out of Microsoft's bundling practices? Our online forum on the topic is going strong. See what battling columnists Mark Gibbs "Backspin" and Dave Kearns "Wired Windows" say, read comments from other readers, then jump in with your own thoughts. **DocFinder: 5511**

Network administration. Quadritek last week announced a new version of its IP and address management software. Come online for primers on the protocols the company's using. **DocFinder: 5617**

SiteWatch. Netscape vs. Microsoft. Which has the better Web site? Site/Watch settles the matter. **DocFinder: 5626**

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News briefs, February 2, 1998

Novell's investment fund

Novell, Inc. officials last week said the firm has established a $50 million venture capital fund called the Novell Internet Development Fund. It is intended to financially assist software companies that are building Internet, Java and Common Object Request Broker Architecture-based wares that will run on NetWare. Rob Hicks, Novell's new vice president of strategic investment, will head up the fund. He said Novell will not fund start-ups. Hicks was formerly president of Novonyx, Inc.

Novell's *Hicks*

Neo charts early Interop path

Router start-up Neo Networks, Inc. plans to unveil low-end and mid-range products at NetWorld+Interop '98 in May, according to Mark Cree, vice president of marketing. One offering will be a fixed configuration router with 10M/100M bit/sec autosensing and Gigabit Ethernet ports. The other device will be a four- or eight-slot chassis with 10/100 autosensing and Gigabit Ethernet ports. Neo is looking to charge about $200 per 10M/100M bit/sec port and less than $1,000 per Gigabit Ethernet port, Cree said. The Bloomington, Minn., company's 16-slot massively parallel processing router will ship in the second quarter.

Sacre bleu!

Network Associates, Inc. last week said it has spotted a new type of computer virus that can spread across desktops by exploiting Microsoft Corp.'s Excel 4.0's Formula scripting language. The virus, dubbed xf-paix, is known to remove toolbars and display the message "Enfin Paix" ("Peace at last" in French).

Packet Engines on the block?

Speculation swirled at ComNet '98 that Gigabit Ethernet start-up Packet Engines, Inc. could be the next of its ilk to be acquired, following in the footsteps of Rapid City Communications and Prominet Corp. According to industry sources, Packet Engines is being shopped by an investment banking firm. Employees of the Spokane, Wash., network equipment company emphatically denied knowledge of such an effort. Sources said there is a debate within the company about whether it should try to go it alone vs. the big internetwork companies.

Domain name overhaul

The Clinton administration last week released its long-awaited Domain Name System overhaul plan via the 'Net. The president's top Internet adviser, Ira Magaziner, put forth a plan that calls for competition within the Domain Name System, which now is operated solely by Network Solutions, Inc. (NSI). The plan calls for NSI to be split into two entities: one that maintains the domain name database for .com, .org and .net, and one that competitively registers domain names. For more details and a link to the proposal, access www.fusion.com and enter DocFinder 5627.

ComNet: Network management wares debut

A bevy of vendors rolled out network management products at ComNet '98. Product introductions included the following:

- Network Associates, Inc., of Santa Clara, Calif., unveiled WebSniffer, a system that identifies problems and sends out alarms when program errors occur. The first release will support Sun Microsystems, Inc. servers running Solaris; the second will support Windows NT. The first release will ship this quarter and start at $1,000 per server.
- Micromuse, Inc., of San Francisco, announced Netcool/Internet Service Monitors, an applications suite that collects Internet/intranet response time and availability data and forwards this information to a central repository. The software monitors HTTP, File Transfer Protocol, Simple Mail Transfer Protocol, Network News Transfer Protocol and other traffic types. The product will be available this quarter for $7,000 per monitor and $20,000 for a suite of seven monitors.

US WEST full speed ahead with DSL

ADSL group crafts standard while US WESTpreps Megabit Service.

By Tim Greene
Washington, D.C.

While some digital subscriber line players have talked about developing a standard by early next year, US WEST, Inc. is actually doing something — crafting a plan for the widespread deployment of DSL services by June.

Starting now in Phoenix, US WEST plans to hit 40 cities with Megabit Service, which upgrades a regular phone line by adding a DSL data channel that offers speeds from a snappy 256K bit/sec to a blazing 7M bit/sec.

Speeds of up to 1M bit/sec in both directions can be provisioned without installing splitters at customer sites. Splitters, devices that keep voice channels from interfering with datastreams, are a hassle to install and could hold up the rollout of some DSL flavors that require them.

A powerful consortium announced last week that it would push to standardize splitterless DSL as soon as possible. Microsoft, Compaq, Intel and the regional Bell operating companies head up this newly formed consortium, called the Universal ADSL Working Group (UAWG). UAWG is winning high visibility for the splitterless approach, but so far there is little technology or commitment to back the vision. Microsoft has reasserted its commitment to put DSL drivers in its operating systems. But Compaq, which could install DSL modems in its PCs, has failed to make that a promise. And the RBOCs said they would stick to their already formulated DSL deployment plans, blending in splitterless DSL as standardized gear becomes available.

COMNET

Go US WEST!

US WEST opted to start working right away with nonstandard gear from NetSpeed, Inc., a start-up that specializes in DSL hardware. NetSpeed promises to upgrade to whatever standard is approved, and US WEST promised continuing support for early customers who buy the service with nonstandard modems.

Prices for US WEST's Megabit Service ranges from $40 per month for symmetric 256K bit/sec service to $80 per month for symmetric 756K bit/sec service. Prices for higher speeds have not been set. Pricing does not include Internet access or, in the case of using DSL for remote LAN access, connecting DSL customers to a corporate site.

US WEST will charge about $200 to turn on the service, and customers will have to buy their own hardware and software for about $200 more. Speeds over 1M bit/sec will require a splitter, and that installation will cost another $200.

New DSL brew

Meanwhile, Paradyne, Inc. last week introduced Multiple Virtual Line (MVL) technology, splitterless DSL that offers speeds of up to 756K bit/sec and supports up to eight MVL modems on a single line. PCs attached to phone jacks on the line share the bandwidth equally. On-site modems can talk to each other over the service, creating an unusual new way to create a small LAN.

MVL is scheduled to ship in March.

CORRECTION

In the January 26 issue, Foundry Networks, Inc.'s telephone number was incorrectly listed. The correct number for Foundry is (408) 731-3800.

Compaq outlines enterprise network strategy

Company says clustering technology could challenge mainframe computing.

By Marc Songini

Compaq Computer Corp. was plenty busy last week. Not only did it scoop up Digital Equipment Corp. (see story, page 1), but it also showed off two new switches and outlined its enterprise strategy for the next couple of years.

The strategy, based in large measure on Compaq's new E2000 Platform Architecture, includes new clustering, storage and symmetrical multiprocessing technologies.

Compaq intends to reach into the highest levels of the enterprise computing market. The company will do so with clustered server systems capable of 500,000 transactions per minute that it plans to offer within two years. These devices could rival the computing power of today's mainframes and other large computers such as high-end RISC servers. Within a year, the company plans to release systems that can crank out 200,000 transactions per minute.

Compaq turns on new switch

The Netelligent 5226 Manageable Ethernet Switch features include:

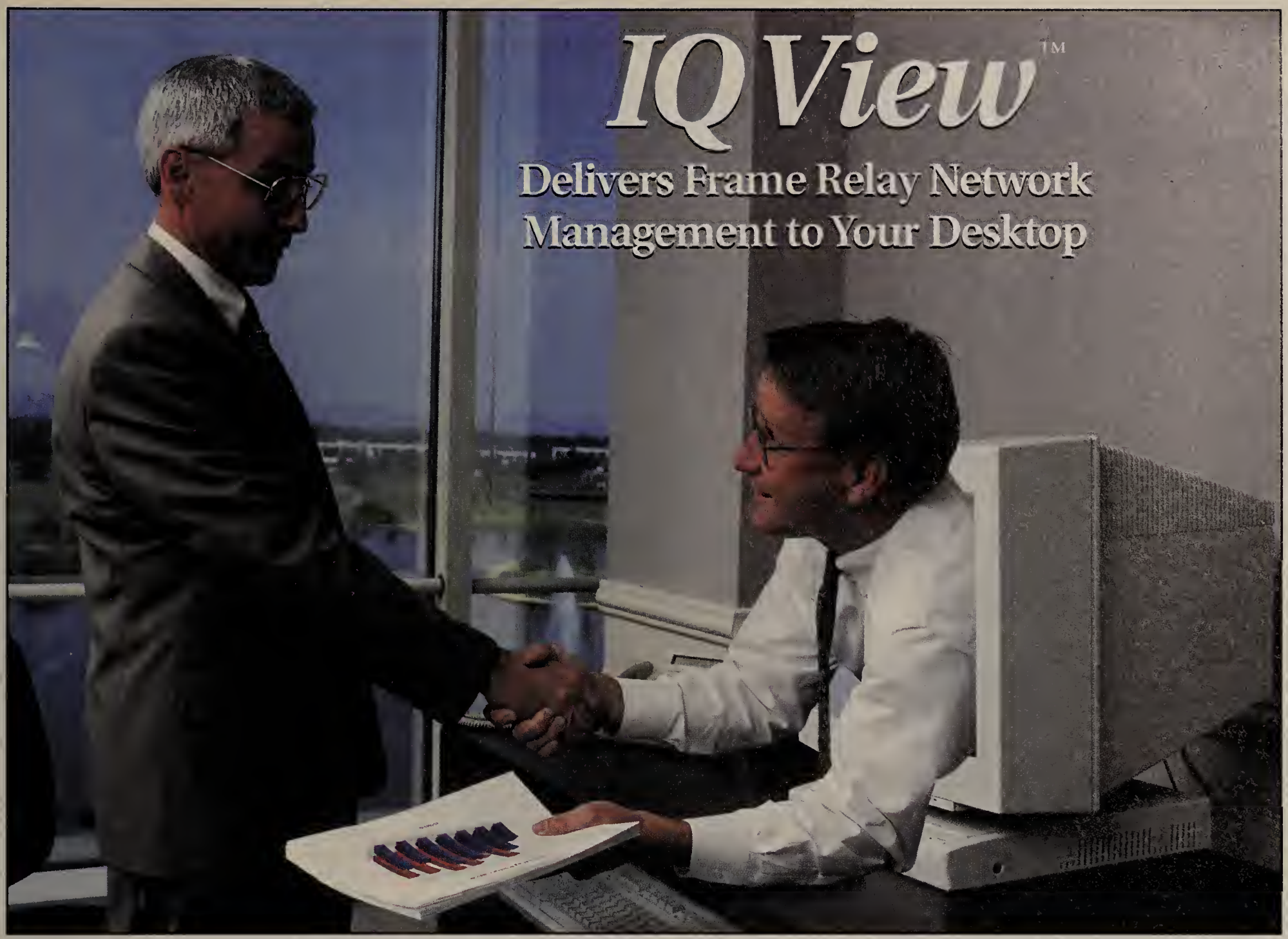
- 1G byte/sec throughput
- Full- or half-duplex ports
- Two Fast Ethernet and 24 Ethernet ports
- Netelligent management software
- VLAN management
- RMON probes

To get to the top of the server performance heap, Compaq will combine an array of technologies — 64-bit processors from Intel Corp. and, possibly, from Digital, high-speed interconnects and Fibre Channel-based storage.

For the interconnects, Compaq plans to use ServerNet, a technology acquired from Tandem Computers, Inc. that offers high-speed data transmission with failover capacity.

Switches en route

Compaq also unveiled two new switches last week at ComNet '98. One is the Netelligent 5226 Manageable Ethernet Switch. The switch offers two 100Base-TX Fast Ethernet uplinks and 24 10Base-T Ethernet ports. The company also announced the Netelligent 5708FX Fast Ethernet switch with eight autosensing 10/100 ports. Both devices are SNMP management enabled.



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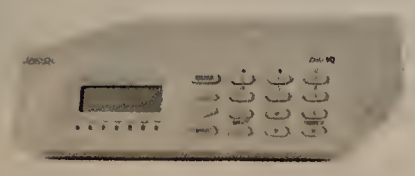

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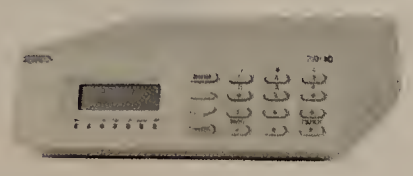

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Armstrong decrees a new network for AT&T

By David Rohde
New York

Someone in the telecommunications industry does believe in Moore's Law after all. And of all people, it turns out to be the chairman of AT&T.

The carrier's new CEO, C. Michael Armstrong, last week announced a radical change in AT&T's network, which will provide hundreds of new user access points for IP, wireless and local telephone services. Combined with a new effort to slash the company's head count and overhead, Armstrong indicated in public — and even more emphatically in private — that the plan is designed to bring down the cost of both voice and data networking for business users.

Armstrong told a crowd of Wall Street and technical analysts here that AT&T will move to an edge switch architecture that terminates dedicated access lines on local telephone switches instead of AT&T's heavily taxed long-distance circuit switches.

According to analysts and AT&T insiders, Armstrong and his deputies also are committed to installing a substantial number of new data switches at the edge of the network to provide a transparent IP user interface.

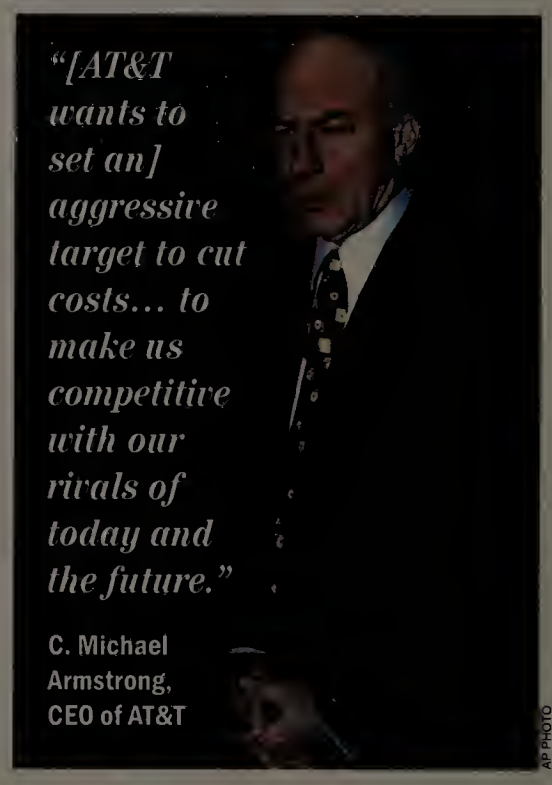
The idea, they say, is to beef up AT&T's WorldNet IP services with economically attractive offers that utilize frame relay or ATM trunking in the carrier backbone without forcing users to actually subscribe to frame or ATM service.

Armstrong gave the clearest statement yet by a major telecom executive that some variant of Moore's Law — the dictum that computer processing power doubles every 18 months for the same cost — might eventually apply to telecom, as well.

AT&T could count on selling more services to business and residential users as price stops being a barrier, Armstrong said.

A major partner in AT&T's plan is expected to be Ascend Communications Corp., which last year purchased ATM switch vendor Cascade Communications Corp.

Frank Ianna, AT&T's executive vice president for network and computing services, confirmed that AT&T this year plans to purchase 112 of Ascend's CBX 500 multiservice ATM backbone switches from the former Cascade family, plus 50 B-STDX 9000 edge switches with IP interfaces, largely to provide a transparent ATM backbone for what users will simply view as IP services. Ianna added that AT&T also has a rapidly growing demand for native ATM user services as big users max out their T-1 frame relay links.



To pay for these and other investments, AT&T said it will cut 18,000 more jobs and reduce overhead to an industry standard 22% of revenues. It also has canceled a project to build a new proprietary superswitch for the network backbone as a follow-up to the company's 4ESS switches.

Through it all, Armstrong gave some conservative projections for AT&T profit growth. That worried Wall Street, but gladdened IT analysts such as Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C. consultancy.

"What he was saying is: Don't expect 'the savings' to be returned to the shareholders," Dzubeck said. "It's going to be returned to the customers."

Armstrong's plan is not guaranteed to succeed. An indication of the work remaining for AT&T was on display later in the week at ComNet '98, where an an-nouncement of AT&T's first set of standard frame relay service-level agreements (SLA) drew a lukewarm response.

For example, AT&T said it will guarantee that 99.99% of packets up to the users subscribed-to committed information rate (CIR) will pass through the network.

Unlike existing offers from MCI Communications Corp. and Sprint Corp., AT&T offered no guarantee for packets above CIR — the ones most at risk of loss.

Analysts attributed the gaps in AT&T's frame relay SLAs to Cisco Systems, Inc.'s Stratacom switches, on which AT&T's frame relay network is based.

"They can't do much more than this with the Stratacom platform," Dzubeck said. Dzubeck also predicted that by next year, AT&T will de-emphasize new frame relay service and beef up end-to-end latency guarantees for its recently introduced WorldNet VPN service.

Ianna confirmed that AT&T is continuing to add to the Stratacom frame relay network, with a planned addition this year of 62 broadband switches to the existing 125-switch network, plus several hundred new access nodes.

Senior Editor Tim Greene contributed to this story.

New devices could ease 'Net bottlenecks

Smart access concentrators can free up blocked telephone switches.

By Tim Greene

Ascend Communications, Inc. and 3Com Corp. are teaching their access concentrators to talk to telephone voice switches.

If successful, the plan could ease Internet bottlenecks and help migrate telephone networks to IP backbones of the future.

Last week, both companies pledged to put telephone signaling technology into their access concentrators, allowing the devices to take dial-up Internet calls off the voice telephone network. These long-duration calls have been blamed for bogging down expensive telephone switches.

Instead of buying more telephone voice switches, phone companies could buy these smart access concentrators — at a tenth of the cost, the two companies claimed. Relieving the telephone switches could mean fewer failures when Internet service provider customers try to dial in to the Internet.

Later this year, Ascend's MAX and 3Com Corp.'s Total Control dial-up access switch lines will carry Signaling System 7 (SS7) software, the protocol stack telephone voice switches use to signal call setup and release, among other things.

SS7 software will enable the concentrators to sit within the phone company network and receive calls from customers dialing in to ISPs. The calls then would be switched to high-speed trunks linking the concentrators to ISP points of presence.

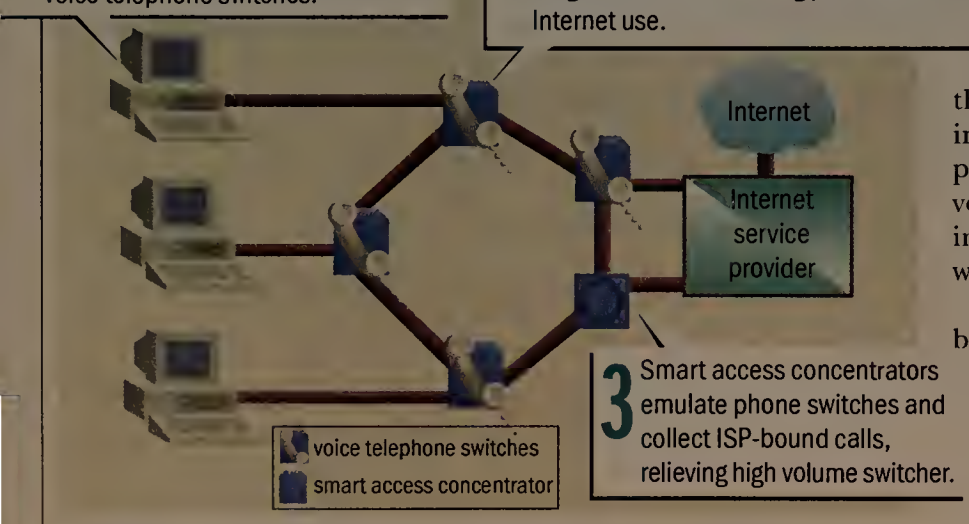
The access concentrators could fulfill that role as soon as the software is complete. But with further intelligence, the concentrators could be gateways between the public voice telephone network as it exists today and the IP backbones that traditional carriers are working toward. Today, phone companies operate separate data and voice networks, but they are starting the move toward single networks that handle both.

Putting voice on an IP backbone requires gateways that support the translation of voice-call signaling into IP addresses. In turn, those IP addresses must be associated with service-quality levels that support voice.

With this in place, voice traffic could then ride with data over a single carrier backbone, thereby reducing carrier costs. With competition finally heating up, these savings might be passed along to customers.

3Com is expected to roll out SS7 upgrades to its Total Control chassis over the course of the year. Ascend is expected to roll out voice over IP and SS7 support in the first quarter. ■

Unclogging Internet access



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OVER THE EDGE?

Newbridge: UB Networks is history

3Com switches to replace UB network gear in Newbridge product line.

By Robin Schreier Hohman

Early last year, Newbridge Networks Corp. tried to gain an entrance into the enterprise market with its $96 million acquisition of switch and hub vendor UB Networks, Inc.

Last week Newbridge officials finally admitted the acquisition was a flop, and said the company will now rely on a new five-year alliance with 3Com Corp. to get products for the enterprise.

Newbridge will no longer develop products from the UB line of Ethernet and ATM gear, said Stuart Aaron, director of product management for Newbridge. However, the company will continue to provide support for all UB products indefinitely.

As part of the alliance, Newbridge will resell 3Com's SuperStack and CoreBuilder switches. Newbridge also will offer AccessBuilder 9600, 3Com's WAN access product for bringing voice, video and data into the LAN. The move rounds out the firm's product line with proven Ethernet and Fast Ethernet products.

3Com will resell Newbridge's ATM WAN switching system, MainStreetXpress 36170, and the accompanying WAN management software, MainStreetXpress 46020. This gives 3Com a WAN product for customers who want one end-to-end provider.

Customers are looking for end-to-end network visibility and the wide area has been a black hole for most network companies. The combination of 3Com's and Newbridge's products is going to help fill that gap, said Mike McConnell, director of LAN Programs at Infonetics Research, Inc., in San Jose, Calif.

The management plan

As for net management software, 3Com and Newbridge are integrating their products so their customers can use the same interface. "We're looking to integrate those two solutions for it to be one network management solution that can view both the 3Com products and the WAN," said a 3Com spokesperson.

The software integration will take place in two phases. First, the companies will work on integrating Newbridge's NetDirector product, which manages the Vivid line of LAN products, with 3Com's Transcend management software. Then, the combined products will be consolidated with MainStreetXpress 46020. The process is expected to take several months. Since both software products are based on Hewlett-Packard Co.'s OpenView, 3Com and Newbridge expect the transition to be smooth.

Newbridge bought UB in January 1997. Newbridge could not give out an estimated customer base for UB products or the number of UB employees still with Newbridge. ■

3Com-Newbridge partnership

Under the terms of the agreement, 3Com will resell the following Newbridge products:

ATM WAN switch:
- MainStreetXpress 36170

WAN management software:
- MainStreetXpress 46020

Newbridge will sell these 3Com products:

Switches:
- SuperStack
- CoreBuilder

Router:
- AccessBuilder 9600

Network management software:
- Transcend Enterprise Manager software suite

Notes client gets browser makeover

By Paul McNamara
Orlando, Fla.

Customers who got their first peek at a radically redesigned Lotus Notes 5.0 client last week offered high praise for its browserlike user interface but aired mild reservations about upgrade issues it may generate.

The more than 9,000 corporate users and business partners at Lotus Development Corp.'s annual Lotusphere conference here heard officials tout the client as a way of handling Internet e-mail, calendaring and scheduling, database management, news groups, browsing and native HTML authoring, all through a single view.

The client is scheduled to ship in the second half of this year, along with an upgrade of the Lotus Domino 5.0 Web application server that will provide more graphical administration tools and allow Notes to be deployed without touching user desktops.

Customers reacted favorably to the unified client strategy and an early code demonstration. But with beta software not yet available, some were reserving final judgment.

"It will be nice to have one central place to go to get anything, whether [it is] a Notes database or something out on the Web," said Brad King, a systems engineer at INFOadvantage, Inc. in Brentwood, Tenn. "[Notes 5.0] looks as though it is fairly intuitive, but you can't put something new in the face of a user and expect them to get it right off the bat."

Making headlines

Notes 5.0 will feature a start page called Headlines, which will let users see their most critical e-mail, hot-linked alerts to updated Web sites, the day's events and other information. The feature looks and acts much like the Outlook Today page that will be found in arch rival Microsoft Corp.'s Outlook 98 client, a similarity noted by a number of Lotusphere attendees.

"It looks great, but because it is not yet complete, I'm not sure it will do the job we need it to do," said Guy Paquette, a Notes developer at Desjardins Corp., a Montreal-based credit union with 20,000 users spread over 1,400 sites. Calendaring and scheduling capabilities were less advanced than he had hoped.

The 'Net push is a good direction, another user argued. "It's going to incorporate the required Internet technology with Notes," said Chris Jording, director of the Global Communications Group for ICI PLC, a British chemical company with 24,000 users worldwide.

Lotusphere ROUNDUP

However, Jording was among a number of customers who expressed concern about end-user training issues that Notes 5.0 will spawn, given that the user interface is a complete departure from the familiar Notes look.

Other show announcements include the following:

- Lotus' Java-based eSuite productivity applets will begin shipping on parent company IBM's Network Station 1000 series by month's end. Also, the eSuite DevPack is now available for free download by application developers at http://esuite.lotus.com.
- Domino for AS/400, IBM's midrange computer, will be available Feb. 27. It will cost $1,495 for a single-processor server, $3,495 for a two- to four-way server, and $16,250 for a five-way or higher server.
- Domino for IIS, a new version of Domino that runs on top of Microsoft's Internet Information Server, has received Back Office certification from Microsoft. ■

Notes to ride knowledge mgmt. wave

Lotus Development Corp. officials claimed that Lotus Notes was a knowledge management platform long before the nebulous phrase became a market. Last week, those same executives told their customers to expect major initiatives around this emerging technology.

Long on vision but short on specifics, Lotus' attempt to stake a claim on the knowledge management frontier was met with equal parts curiosity and skepticism by customers and industry analysts.

Among the knowledge management initiatives Lotus did pledge for this year were: A single user interface for broader and more powerful searches that span not only Notes databases, but sites and domains; same-time, real-time capabilities, such as chat, whiteboards and application sharing; continued evolution of Learning Space, the company's distance learning software; and a developing product called Expert Network, which will allow companies to compile databases and graphical maps of employees' skills and interests.

While some customers were heartened to hear of Lotus' knowledge management foray, others were less than impressed. "It seems to be a big issue for Lotus, but it's not for us," said one user.

—*Paul McNamara*

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Cabletron changes course, introduces first router family

By Robin Schreier Hohman
Washington, D.C.

Cabletron Systems, Inc. last week made its first foray into the routing world.

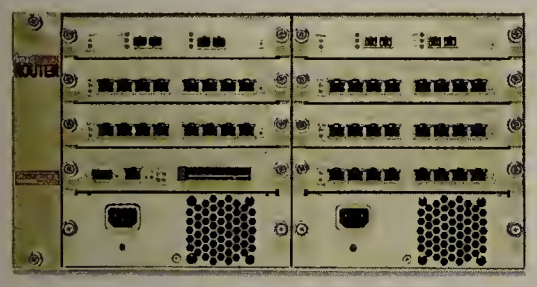
Using technology it recently acquired from YAGO Systems, Inc., the company introduced the SmartSwitch router family, which should help Cabletron users build next-generation backbones. The routers will also help the company more effectively compete with market leaders Cisco Systems, Inc., Bay Networks, Inc. and 3Com Corp.

Cabletron previously built networks relying on its SmartSwitch hubs and switches and SecureFast software.

The SmartSwitch router family consists of two boxes, an eight-slot Model 8000 and a 16-slot Model 16000. Both boxes are rebranded versions of YAGO's MultiLayer Switch Router 8000.

The eight-slot SmartSwitch Router 8000 delivers 15 million packet/sec and supports up to 14 Gigabit Ethernet ports and 56 10/100 Ethernet ports.

The 16-slot model delivers 30 million packet/sec and supports up to 30 Gigabit Ethernet ports and 120 10/100 Ethernet ports.



One of Cabletron's *new SmartSwitch routers.*

"Cabletron's SmartSwitch routers are fast because they employ a chip created by YAGO engineers that's designed to do routing tasks," said Glenn Gabriel Ben-Yosef, president of Clear Thinking Research, Inc., in Boston. "Things are run in the hardware at wire speed, as opposed to the software."

Both boxes run SecureFast, the software that controls the routers and tells the switch how to route, perform Layer 3 switching and link virtual LANs. SecureFast also supports policy, accounting and directory services.

The YAGO connection

Experts have been critical of SecureFast in the past, saying it was proprietary — which made it difficult for users to mix and match Cabletron devices in a multivendor environment.

But because Cabletron has had a 25% interest in YAGO for the past year, Cabletron engineers have been working with YAGO engineers to make sure SecureFast will work with the new SmartSwitch routers. In fact, Cabletron says SecureFast has been standards-compliant since November.

Cabletron also will produce an integrated management module for Spectrum, its network management software, which will let users manage the routers. Cabletron plans to add ATM, frame relay and other WAN modules in the second half of this year.

Prices for the new SmartSwitch routers begin at $499 per port. The Model 8000 is expected to ship in the second quarter and the 16000 in the second half of the year. Cabletron can be reached at (603) 332-9400.

Margret Johnston of the IDG News Service's Washington, D.C. bureau contributed to this story.

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Management showdown picks at vendor warts

By Jim Duffy
Washington, D.C.

COMNET It's not a presidential election year in Washington, but that doesn't mean there wasn't a debate.

On a day when the presidential scandal took a back seat, five of the leading enterprise management vendors fielded pointed questions from a panel of experts and each other in *Network World*'s Network and Systems Management Showdown at last week's ComNet '98 show.

The air became electric early when IBM/Tivoli Systems, Inc. was asked if the recent acquisitions of two of its third-party developers — Unison Software, Inc. which makes a job scheduler and help desk vendor Software Artistry, Inc. — signaled a shift in its framework strategy to one that mirrored rival Computer Associates International, Inc.'s (CA) practice of selling management application suites.

"Tivoli has not now, nor has it ever, nor will it ever, adopt a strategy that is similar to CA's," said Tom Bishop, vice president of infrastructure development at IBM/Tivoli.

CA, too, had to rationalize its recent plan to buck the application suite tradition and offer a Unicenter TNG framework, a version of the product without the CA applications. "What we are doing is making [the Unicenter TNG] framework available for partner solutions based on what our partners have told us. We still provide integrated solutions to customers," said J.P. Corriveau, senior vice president of technology integration at CA.

Another hot topic was Cabletron Systems, Inc.'s decision to develop a data warehouse and its connection to network management. Cabletron said its warehouse is broad in scope, but the company could not clearly define a role for it in network management. "The architecture that we're bringing to the whole Spectrum suite is really very similar to what we've seen emerge in IT, such as SAP's architecture," said Chris Oliver, Cabletron's chief technology officer.

When pressed further on the warehouse strategy and its relationship to network management, Oliver said, "Data warehousing isn't for your average network manager today. It's really been intended [for] the outsourcing market."

When it came time for vendors to grill each other, the heat was turned up even more. Bitter rivals CA and IBM/Tivoli hogged the spotlight. CA's Corriveau asked IBM/Tivoli's Bishop, "What do you say to a client that bought Remedy and AutoSys and their help desk and scheduling packages? [Can they now see] a migration or conversion in their future?"

Bishop replied, "In fact, the question as asked is a little bit misleading. The clear intent with respect to Unison and Software Artistry is to identify those functions and services which properly belong as part of the infrastructure."

Hewlett-Packard Co. took the opportunity to challenge Sun Microsystems, Inc.'s commitment to Windows NT in light of Sun's dedication to its Solaris operating system. "Sun is building product to manage in [the Windows NT] environment," said Stephen Borcich, director of product development for Sun's network software group. "We also have capabilities that we are now distributing — for instance, browser-like technology — that allow management systems to run on any platform."

Sun countered by inquiring about HP's commitment to the Unix-based HP-UX in light of recent OpenView momentum around Windows NT. "We're driven by our customers' demands. In terms of support for HP-UX, absolutely, there's no question of that or of any other platforms that are important to our customers," said Martin Haworth, manager of solutions and support services for HP's OpenView software division.

HP also took some heat from Bishop for having a fragmented and confusing management strategy that last year saw HP's server division endorse and announce plans to resell CA's Unicenter TNG platform. "There was a lot of miscommunication," Haworth said. "If you look at our investments over the past 12 months it's pretty clear that OpenView is here to stay." ■

Representatives *from the leading management software vendors had some choice words for each other (left to right: Cabletron's Chris Oliver, CA's J.P. Corriveau, HP's Martin Haworth, IBM/Tivoli's Tom Bishop and Sun's Stephen Borcich).*

Network World *Senior Editor Jim Duffy and industry analysts Kevin Tolly and Rick Villars (left to right) grilled the management software representatives.*

Working @ Netscape: Hot spot or has-been?

Have the recently revealed chinks in its armor tarnished Netscape's corporate culture?

By Andy Eddy
Mountain View, Calif.

Netscape Communications Corp. has faced its share of, in the words of David Bowie, "Ch-ch-ch-ch-changes."

Just three years ago, Netscape was a shining star in Silicon Valley, a "place to be" for software jocks. But last week, the company faced the first losing quarter in its history, had its lowest stock price since the company went public in early August 1995 and had worldwide layoffs estimated at about 10% of its work force.

As a result, Netscape is backing away from a number of plans, many centered around Java. Here is what has changed: Some language versions will be eliminated, some documentation projects will be canceled, in-house Java run-time development has been eliminated, and the next-generation all-Java Communicator client suite has been scrapped.

The evolution (and sometimes devolution) of companies such as Netscape has taken place under a compressed measure often referred to as "Internet time," a phenomenon similar to "dog years," that has taken its toll on many IT companies. In its drive from browser company to its latest self-coined moniker of "The Internet Company," Netscape has hit a series of potholes.

Just the same, it does not appear that the rocky ride is causing an overwhelming desire among its employees to get off the bus. Chris Holten, Netscape's corporate public relations manager, has been with Netscape for about three years and has experienced Netscape through most of its phases.

"Not much has changed in the culture. We still have incredible, exceptional benefits," Holten said. She reeled off a series of on-site resources at Netscape's campus that are not among the norm, such as dry cleaning, a photo lab, dental care, fitness clinics and seminars, free soda and even lactation stations and company-sponsored breast pumps for new mothers.

A concierge service also is provided so employees do not have to lose valuable productive time planning off-work recreation, such as trips and dinner reservations. And there is a policy that enables workers to bring their pets to the office.

Perks such as that keep Netscape high on the list of desirable places to work in Silicon Valley, and many still see it as an innovation factory. "From a corporate-culture stand point, Netscape is looked to, like Sun and others, as a place to stay ahead and for the opportunity to create," said Betsy Collard, director of programs at Career Action Center, in Cupertino, Calif. "It's fast-paced and attracts the best and brightest — like getting into Apple 15 years ago."

It is just that atmosphere that has some recently laid-off employees more disappointed than bitter. A former employee in security product marketing, who chose not to be named, was among those let go. "I don't take it personally, and given the opportunity I wouldn't hesitate going back to Netscape," she said. "I believe in Netscape and its products. It'll bounce back from this."

Of the nearby recruiters and career-consulting agencies *Network World* contacted for this article, none saw above-average traffic from Netscape employees.

But that could change. Netscape's financial and strategic roads are still a bit treacherous, which may have taken the gleam off its appeal to potential employees. Sharon McNally, owner of CareerPro, a San Mateo, Calif., job-search firm, thinks Netscape's allure has faded somewhat. "Netscape's growth has kind of peaked, and the troubles with Microsoft haven't helped," McNally said. "It's probably become just another one of the companies in the Silicon Valley." ■

Digital deal

Continued from page 1

hardware and software products.

Sorting through what assets will fit nicely into Compaq's overall plans will take 18 months, said Joe Barkan, research director with Gartner Group, Inc., in Stamford, Conn. "They have to dig through the Digital rubble piece by piece to see what fits and what needs to be thrown away," Barkan said.

Hidden gems

Digital's heavy investments in several NT-related areas should yield a big payoff for Compaq.

"Digital's got a whole NT software strategy that Compaq as a hardware company could never have cultivated on its own," Barkan said.

Digital's own OpenVMS clustering technology lies at the heart of the NT-based Microsoft Cluster Server. Microsoft's and Digital's continued development of add-on products, which will make NT as reliable as OpenVMS, will only help Compaq's position in the enterprise.

Other hidden NT gems are Digital's Affinity and AllConnect programs. These lines comprise a set of software tools that allow OpenVMS and Digital Unix boxes, respectively, to interoperate with NT machines on the same network.

"We always thought it was odd that Digital would build such great tools to rush users off its own systems and onto NT boxes," said Dan Kusnetsky, an analyst with International Data Corp., in Framingham, Mass. "But that strategy looks much better now because they will be keeping the large customers in the family."

The AltaVista division of Digital — most widely known for its search engine products — could bring some unexpected gains to Compaq in terms of electronic commerce, Kusnetsky said.

Digital ships firewall and secure tunnelling products under the AltaVista brand that could anchor an electronic commerce package from Compaq in the future.

Terry Shannon, an Ashland, Mass.-based analyst and author of the "Shannon Knows DEC" newsletter, said Digital's Storage Division is an underrated piece of the company's portfolio that Compaq should maintain.

Compaq will not be getting a network hardware division with this deal, because Digital last month sold most of that unit to Cabletron Systems, Inc. But sources close to the company said Compaq will be picking up approximately 100 engineers who are working on Gigabit Ethernet, Fast Ethernet and FDDI network adapters.

Weeding out

Observers expect quite a few Digital product lines to be discontinued.

Topping the list is Digital's line of Intel-based desktop and laptop PCs. Additionally, the recently announced line of NT-only DigitalServers is likely to be dropped by Compaq in favor of its own PC LAN servers.

"Digital's PC products completely overlap with Compaq's core business and you can kiss them goodbye," Barkan said.

On the software side, Digital's PathWorks LAN operating system will likely be dropped by Compaq soon, because it cannot compete with either NT or Novell, Inc.'s NetWare. Likewise, Digital's software for managing PC servers, called ServerWorks Manager, is likely to get the ax in favor of Compaq's Insight Manager.

Not so certain is the fate of the AlphaServer line. These machines support OpenVMS and Digital Unix. Digital itself has given mixed signals over its commitment to the AlphaServer line by partnering with Sequent Computer Systems, Inc. on a version of Digital Unix that runs on yet-to-be-released 64-bit Intel servers.

Additionally, Digital has handed manufacturing responsibilities and some patent rights for the Alpha chip over to Intel.

Senior Editors Robin Schrier Hohman and Jim Duffy contributed to this story.

1998 Seminar Dates and Locations:

April 6	Washington, DC
April 7	Philadelphia, PA
April 22	Atlanta, GA
April 23	Dallas, TX
May 12	Chicago, IL
May 13	Minneapolis, MN
May 19	Boston, MA
May 20	New York, NY
June 9	Newport Beach, CA
June 10	San Francisco, CA

Directed and presented by
Daniel Blum
Rapport Communication

Seminar Course Overview:

Enterprises across the world are eager to capitalize on Internet client/server e-mail as a universal infrastructure utility for supporting vital groupware and electronic commerce applications. However, neither monolithic proprietary mail systems nor yesterday's shareware mail packages can successfully support very high volume, extremely mission critical applications on your intranet, extranets, or the Internet at large.

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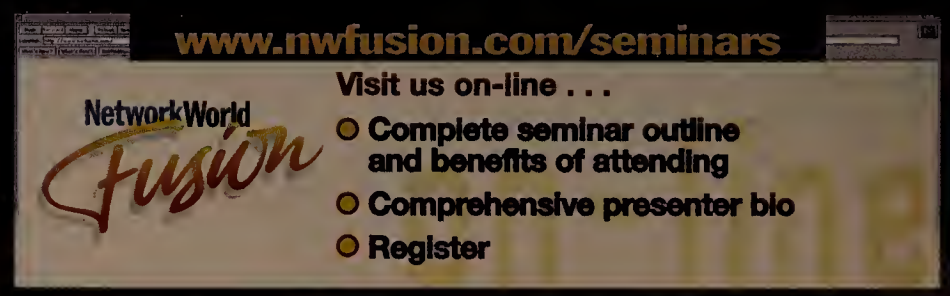

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Briefs

■ *Burlingame, Calif.-based* **Tangent Computer Corp.** *last week rolled out a* **Pentium II-based server,** *the Enterprise X-D, that supports RAID and includes LAN management utilities. The server, which can be configured with single or dual Pentium II 266MHz or 300MHz processors, offers up to six PCI and two ISA expansion slots and can expand to support 1G byte of RAM. The system includes Intel Corp.'s LANDesk Server Manager software.*

The Enterprise X-D is available now and starts at $6,995.

✆ Tangent: (800) 800-5550

■ **Mission Critical Software, Inc.,** *of Houston, last week shipped a new version of its* **NT domain management** *tool that includes resource management and domain consolidation features.*

Enterprise Administrator 4.5 (EA) lets an administrator delegate the task of monitoring and managing NT servers, connected devices and NT services without giving these "deputies" full administrative rights. The product lets an administrator restructure NT domains by moving user accounts, re-creating global and local groups, and adusting security permissions on files.

EA 4.5 is available now for $900 per NT domain.

✆ Mission Critical: (888) 323-6768

■ **Novell, Inc.** *will ship a new version of its low-end operating system bundle equipped with messaging software. In March, Novell will ship GroupWise with* **NetWare for Small Business.** *GroupWise will be managed via existing NetWare for Small Business tools such as Novell Easy Administration Tool for creating and deleting users.*

Microsoft ties fuel Digital's engine

Companies plan to extend fruitful alliance centered on Microsoft Windows NT.

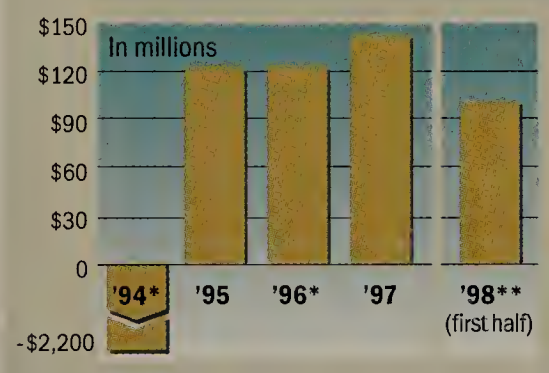
By Christine Burns and Paul McNamara

Digital Equipment Corp. is looking more and more like an East Coast branch of Microsoft Corp., and its bottom line is looking better and better.

Coincidence? Not according to industry experts who have watched Digital begin to turn things around over the past year or so, in no small part by latching on to a few Microsoft juggernauts: the Windows NT network operating system and the Exchange messaging server. These moves have put a healthy glow on Digital's sickly financials and have given the company a luster that Compaq Computer Corp. found difficult to resist.

DIGITAL NUMBERS ON THE RISE

Digital has seen its profits rise since partnering with Microsoft in August 1995.



*Includes $2 billion restructuring charge
**First and second fiscal quarters

Last week, Digital CEO Robert Palmer and Microsoft's Bill Gates announced the latest extension of their corporate alliance. This one is designed to make Digital Microsoft's first Prime World Wide Integrator for Windows NT. The press conference took place two days after Palmer shared a stage with Compaq chief Eckhard Pfeiffer and announced that Digital was being acquired by Compaq for over $9 billion.

Palmer and Gates outlined the terms of Phase II of the Alliance of Enterprise Computing — a deal first penned in August 1995 — which will expand the companies' collaboration on NT service and support, commitment to the Digital Alpha hardware, and development of software that will help move NT into more high-end networks.

"This [alliance] is a very concrete thing for us," Gates said. "We have a lot of customers that see this combination of services as the reason they could bet on Microsoft products. They count on Digital to pull it all together and work effectively for them," Gates said.

Under the terms of Phase II of the alliance, Digital this year will up its NT ante by doubling the number of Microsoft Systems Certified Engineers (MSCEs) it employs to 3,000 worldwide, a number Gates said surpasses the MSCEs employed by Microsoft.

Digital will institute NT 5.0 and SQL Server 7.0 early adopter programs to push those new Microsoft products into large customer networks.

On the technology side, Microsoft has agreed to synchronize the release of NT 5.0 for 64-bit Digital Alpha machines and servers using Intel Corp. 64-bit Merced processors. And Digital and Microsoft will work together on a new family of 32- and 64-way symmetric multiprocessing Alpha servers that give NT linear scalability. Finally, Digital and Microsoft will work together on add-on software that gives NT the high-end clustering and transaction services Digital currently offers with its Open VMS mainframe systems.

Users already benefiting from the alliance were pleased with the prospect of deeper ties between the two companies. According to one customer, the collaboration served his company well during a recent Exchange rollout that covered 115 sites and more than 36,000 seats. "Digital was very cooperative during our Exchange implementation," said Clay Harper, workstation manager at Dow Chemical Co. "We compared notes with them during the design phase, which happened to be during their major conversion to Exchange internally."

This expanding partnership gives Microsoft a ready-made sales channel and instant credibility inside the corporate glass houses.

But industry analysts agree Digital is the big winner here. The Microsoft connection has allowed Digital to shift its financial dependence away from its declining Open VMS and Digital Unix business to the exploding NT marketplace.

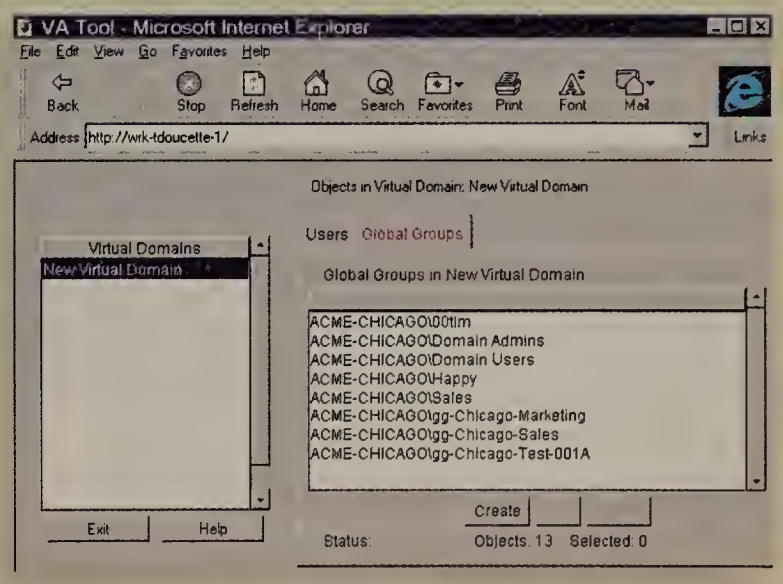
Terry Shannon, an Ashland, Mass.-based analyst and author of the "Shannon Knows DEC" newsletter, estimated that alliance-related revenue for Digital will weigh in at more than $3 billion this year. "Open VMS has always been a high-end profitable niche for Digital but the door is wide open for them to make even more money with NT," said Shannon.

A recent study from International Data Corp., a research firm based in Framingham, Mass., indicates there is room for Digital to grow in the NT market. Of 566 IT professionals surveyed, only 7% said their main NT system supplier was Digital.

But IDC analyst Dan Kusnetsky said Digital's low standing in the NT race is due to the fact that NT has penetrated only into small and midsize businesses, where Compaq Intel-based NT servers are preferred. "As NT moves up the enterprise food chain, which will happen more over the next five years, Digital is going to become increasingly more important here," said Kusnetsky. ■

QUICK TAKE

FastLane eases NT administration



FastLane Technologies, Inc. last week rolled out a Web-based tool that lets an administrator manage network resources across multiple NT domains.

Virtual Administration (VA) Tool for Windows NT is an application that runs inside any browser. From there, the administrator can define a single virtual NT domain that is comprised of users and resources which physically reside in multiple NT domains. This setup allows corporations to give groups of users access to specific network resources across the company, without having to administer specialized access on a domain-by-domain basis.

VA Tool for Windows NT is available now for $14 per user account.

✆ FastLane: (902) 421-5353

WIRED WINDOWS

Microsoft's directory foibles

History buffs will tell you that when leaders are having domestic problems they'll often look around for a war to jump into, which will unite the people in the face of the common enemy.

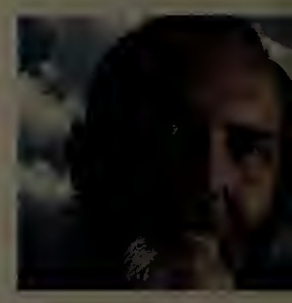
Rumors out of Washington concerning a possible military strike at Iraq seem to fit that strategy to a tee.

Microsoft chief Bill Gates and staff may have been thinking the same thing when they launched a preemptive strike at Novell's NDS for NT.

Maybe Microsoft was trying to move away from its embarrassing performance in the Department of Justice/Internet Explorer fiasco. That could be one reason the firm spread a lot of fear, uncertainty and doubt among NT network administrators by threatening to withdraw all support of systems running NDS for NT.

Instead of launching a powerful campaign against NDS for NT, though, the Microsofties spent a couple of days issuing statements and then retracting them. After first claiming that NDS for NT overwrote a number of critical operating system files, they backed down and said only two files were affected, then one. As each charge from Gates' PR army was rebuffed, new press releases were issued. In the end, Microsoft was left with one argument — NDS for NT didn't integrate NetWare and NT, it was an all-NDS solution.

Wake up, Redmond! Network administrators want one directory system to handle all of their platforms. From S/390 to NetWare, NT to Solaris, only Novell's NDS does them all. Active Directory — Microsoft's answer — is a year and a half overdue and won't be operational for at least another year. Even then, it won't have NDS' capabilities.



Dave Kearns

Enterprise nets can't wait; they need solutions now.

At the beginning of World War II, Hitler's generals told him they could not support a war in both Western Europe and Russia. This forced him to reach an accord with Russia. But he got impatient and abrogated that treaty, and thus began his own downfall. Redmond should study this carefully.

With legal battles being waged against Sun over Java on the one hand and against the Justice Department over bundling on the other, Microsoft should be looking for friends, not more enemies.

Supporting NDS for NT doesn't imply supporting NetWare. It shouldn't impact NT server sales — NT still is a better application server than NetWare is. But it would demonstrate Microsoft's willingness to adopt superior technologies offered by competitors. And supporting this solution would allow network managers to get a firm grasp on their current directory needs, thus winning lots of friends in the user community. It could be a big win for Microsoft — something it desperately needs right now.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Tip of the week

Multiplatform group scheduling is a major headache for lots of network administrators. On-Time from Open Text Corp. (formerly Campbell Systems) is a client/server scheduling solution. There are server versions for NT, NetWare and VINES, as well as a Web browser-based client (in addition to native Windows and Macintosh clients). Browse to http://www.on-time.com for all the details.

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FOUNDRY NETWORKS

SPECIAL FOCUS

Thin-client net impact

Network computer reality

If you plan to roll out thin clients, you'd better take a good hard look at your network infrastructure.

But according to those who have gone before, your network may not need as much beefing up as you think.

"May" is the operative word. Right now, there is precious little hard data on thin-client performance with real user loads, especially on a large scale or over WANs. The evaluation is made more difficult by the fact that Java network computers (NC) and Windows-based terminals have very different network requirements.

Experts recommend creating pilot projects that accurately reflect the user environment in which thin clients will be used. Then, as the new clients are rolled out to more and more users, the network administrator should continually monitor network traffic, server loads, response time and application performance to detect potential problems as soon as possible.

Windows-based terminals are server-oriented thin clients — the server handles all application processing, data management and other tasks. The Windows terminal has some type of compact client software and communications protocol. Like traditional mainframe terminals, the device is in constant contact with the server.

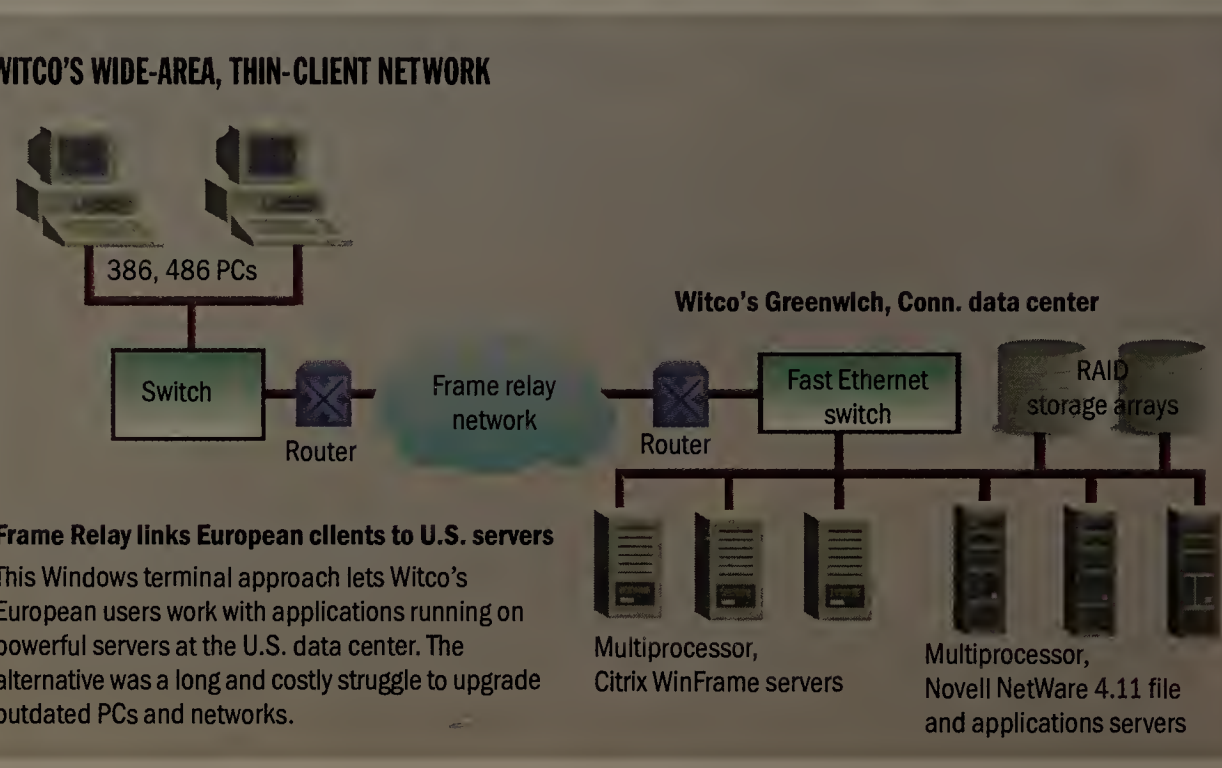
By John Cox

ate the real costs of adopting thin clients.

One company, with some 65,000 desktops, was concerned about network traffic if both PCs and NCs were using the same network at the same time. "What they determined was that there were no significant network implications, and that everything would run fine together," Roche says.

One potential problem was identified for Windows terminals: running a screensaver program on the Citrix Systems, Inc. WinFrame server and displaying the image on numerous desktops. "These constantly generate traffic and the users thought this was not a good idea," Roche says.

WITCO'S WIDE-AREA, THIN-CLIENT NETWORK



Frame Relay links European clients to U.S. servers

This Windows terminal approach lets Witco's European users work with applications running on powerful servers at the U.S. data center. The alternative was a long and costly struggle to upgrade outdated PCs and networks.

By contrast, Java NCs, such as Sun Microsystems Inc.'s JavaStation, are true computers. They run a midget operating system (usually based on a flavor of Unix), the Java Virtual Machine, a Web browser and some communications software. These desktop-oriented thin clients use a server relatively infrequently: to download Java applets or a complete client software package, or for file and print services, electronic mail and access to host applications and data.

In theory, these differences create very different network demands. Yet some early evidence suggests that for many companies, there is almost no effect on their current network — if the net already is well designed and robust.

"We just couldn't find any implications in the seven companies we studied in depth," says Ed Roche, vice president of Concours Group, a Kingwood, Texas, consulting company that sent a team of experts to work with seven clients to evaluate the real costs of adopting thin clients.

It's possible that NCs may need more bandwidth to the desktop, especially if they're moving substantial Java applications over the net.

But Windows terminals are moving small packets continuously: According to some users, these devices are affected more by network latency — the tiny delays that accumulate and bog down response time as traffic moves through multiple connections.

Cases in point

Witco Corp. is a specialty chemical company based in Greenwich, Conn., with facilities at 85 remote sites in the U.S. and overseas. The company decided in 1996 to deploy SAP AG's SAP business application suite worldwide. SAP has a heavyweight Windows graphical client application.

"Over the course of 1997, we found supporting these clients was pretty difficult," says Cathy Mangiameli, Witco's network manager. During an inspection of the European sites to prepare for deploying SAP overseas, she found the overseas rollout would be even harder because the European users typically had Intel 386 and 486 PCs on networks with outdated wiring. "It would take a massive effort to convert all these to support the SAP client locally," she says.

Scribbling on a napkin in the bar car of a train rolling through the Italian countryside, Mangiameli hit on a solution: Use Citrix Systems' WinFrame server and clients to let the European users dial in to central application servers.

Citrix estimates that each WinFrame client can use up to 20K bytes of bandwidth. "So we figured we'd need big network pipes," Mangiameli says. During a test that mimicked the final network, however, Witco's network managers found the devices used only about 7K bytes with this particular application package.

BCE Mobility, the wireless service subsidiary of Bell Canada Enterprise, likewise focused much attention on making its WinFrame server farm as reliable and as fast as it is powerful. These Intel-based multiprocessor servers are linked via a 100M-bit switched backbone net.

But large bandwidth has not been needed for the hundreds of call-center staff BCE Mobility has linked to the server-based applications. "We're running 10M-bit shared Ethernet to the desktop," says George Morris, senior LAN specialist at BCE Mobility (he has subsequently left to take a post with Citrix).

The Java story

There are very few large-scale deployments of Java NCs that actually are using Java applications heavily.

Two of the biggest deployments, not surprisingly, are in two prominent NC vendors — IBM and Sun. Neither company has had to make changes or improvements to its basic physical network so far as they've rolled out thousands of Network Stations and JavaStations, respectively.

Roche says there's little evidence to suggest that NCs threaten to choke a network. "My supposition is that if you have general, business information workers who are not doing multimedia applications, and there are not too many users, a standard Ethernet network seems to be fine," he says. ■

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Briefs

■ **Luminate Software Corp.** *last week announced Luminate for SAP R/3 Version 1.3, management software tailored for technical management and end users. Version 1.3 now provides insight into the queue time breakout and response time of* **SAP R/3 servers;** *a view into R/3 application servers; location views; and user ID, program and server drill-down fields. It also offers integration with Microsoft Corp.'s Excel spreadsheet software.*

Luminate for SAP R/3 Version 1.3 is priced starting at $50,000. It is available now.

✆ Luminate: (650) 599-0310

■ *Users this year should be able to use their* **56K bit/sec modems** *without having to worry whether they will be able to talk*

to other high-speed modems at the other end. **Lucent Technologies, Inc.** *and* **3Com Corp.** *this spring will produce 56K bit/sec modems based on a preliminary 56K bit/sec modem standard expected to be approved next month. They plan interoperability testing to speed the process. However, Rockwell Semiconductor, a Lucent modem partner, has opted out of the tests.*

■ **Hewlett-Packard Co.** *has integrated its* **HP OpenView Desktop Administrator and HP TopTools** *desktop management products.*

The integration allows IS managers to use TopTools to power on hundreds of PCs simultaneously during off-hours, causing minimal disruption to end users. Managers can then perform software distribution, inventory and configuration management, and software license metering with Desktop Administrator.

HP OpenView Desktop Administrator with HP TopTools integration is scheduled to ship early this month and is free to current HP OpenView Desktop Administrator customers.

✆ HP: (888) 226-4379

Ganymede offers net performance monitoring tool

Pegasus tracks end-to-end response time of SNA, TCP/IP and IPX networks.

By Marc Songini

A new software tool from Ganymede Software, Inc. should help users quickly and more easily spot network performance problems.

The company last week announced Pegasus, a software package that lets users monitor the end-to-end response-time performance of devices linked to SNA, TCP/IP and IPX networks.

PROFILE: GANYMEDE SOFTWARE

Headquarters:	Research Triangle Park, N.C.
Founded:	April 1995 by four ex-IBMers
Funding:	$4.5 million
Employees:	50
First product:	Chariot, a performance management package that simulates client/server loads
New product:	Pegasus, a package for tracking end-to-end response time that is based on Chariot

Pegasus is Ganymede's first response-time tool, but the company's Chariot network test package already is widely deployed in customer sites. Chariot is a software-based performance measurement tool that lets users simulate the traffic generated by new client/server applications and predict the impact those applications will have on enterprise network performance before they are widely deployed.

Expanding upon Chariot, Pegasus can isolate problems and help network managers ensure that service-level agreements are being met.

By getting response time data, network administrators have all they need to know to ensure the net is performing properly, said Steve Joyce, vice president of marketing for Ganymede. Pegasus provides real-time monitoring of the network, rather than the passive, historical device reporting typical of most Remote Monitoring (RMON)-based probes in the market.

But Pegasus can be used in conjunction with RMON tools, Joyce said. For example, administrators can take Pegasus reports and use them for trend analysis, performance forecasting and historical tracking.

Pegasus consists of two components: server software, and agents that are called Network Performance Endpoints (NPE). The server runs on a Microsoft Corp. Windows NT server and gathers data reported by the agents. One server can handle up to 2,000 connections. The agents run on a variety of operating systems, from MVS on an IBM mainframe to Windows 3.1 and Novell, Inc. NetWare servers.

NPEs compile and measure response time and throughput of the network between the agent and the server. The measurement takes into account any net devices — such as routers or switches — that are between those agents and the server. The statistics are then formulated into a management report for easy review. They also can be accessed from any Java-enabled Web server in the network.

The company plans to roll out Pegasus in the second quarter of 1998. The server will cost $7,500 per license; NPEs are licensed by operating system with the cost varying from $2,000 to $8,000. Endpoints can be installed on an unlimited number of machines.

✆ Ganymede: (919) 469-0997

Quadritek aims high in IP address mgmt.

QIP 5.0 designed as manager of network services.

By Jim Duffy
Malvern, Pa.

Quadritek Systems, Inc. has unveiled a new version of its IP name and address management software that lets users better manage distributed network services.

Version 5.0 of Quadritek's QIP Enterprise product runs on Unix and Windows NT workstations and servers. It is targeted at mid- to large-scale enterprise networks and is designed to allow users to control distributed administrative tasks, such as address server backup, from a central console.

"We would like to get a single logon for everything; we hope LDAP is the solution for us."
— Michael Stark, BankBoston

To accomplish this, QIP Enterprise 5.0 features a number of additions and enhancements to Quadritek's basic Dynamic Host Configuration Protocol (DHCP) and Dynamic Domain Name Service (DDNS) services. Among the more important are:

- DHCP Failover services
- Support for Domain Name Service (DNS) and DHCP services from Microsoft Corp., IBM and Novell, Inc.
- A Lightweight Directory Access Protocol (LDAP) gateway to directory services

DHCP Failover provides a backup server to the primary DHCP server for redundancy and high availability. This feature hits home with some users.

"That's one of the key [features] we were after when we originally purchased the product," said Michael Stark, senior network consultant at BankBoston, in Waltham, Mass. BankBoston has to manage between 30,000 and 40,000 IP addresses, Stark said.

QIP Enterprise 5.0's support for IBM, Microsoft and Novell DHCP and DNS servers means users do not have to implement Quadritek's DNS and DHCP servers in order to manage an IP environment with Quadritek's QIP. The LDAP gateway allows users to access Netscape's Directory Server and Novell's Directory Server to better manage who gets an IP address and access to the IP network and applications. The gateway will support Microsoft's Active Directory when that ships.

"We would like to get a single logon for everything; we hope LDAP is the solution," Stark said. BankBoston uses Novell's NDS but needs links to mainframe, Windows NT and other environments, he said.

QIP Enterprise 5.0 will ship at the end of this quarter. Pricing for core functionality starts at $5 per address.

Analysts say Quadritek is succeeding in making QIP a comprehensive network manager. But the company has to overcome the perception of being a niche player with a niche product. "By adding the directory support, by tying in the LDAP, they're starting to build more of a product solution as opposed to a utility," said Rick Villars, director of network management at International Data Corp., a consultancy based in Framingham, Mass. "But they've got a lot of work to do in terms of building a presence and getting a core group of people to start using their technology."

QIP Enterprise 5.0 highlights

- DHCP failover
- Support for third-party name and address services
- LDAP gateway
- Integrated authentication services
- Database replication
- Secure DNS zone file updates
- Audit and billing management applications

✆ Quadritek: (610) 725-8535

pros & cons

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Wireless • Regulatory Affairs • Voice Equipment

Briefs

■ *Despite a recent* **$400 million takeover** *bid from USinternetworking, Inc.,* **PSINet, Inc.'s** *shareholders approved an investment deal with IXC Internet Services, Inc., which was announced last summer (*NW, *July 28, 1997, page 6). The deal gives PSI 10,000 route fiber miles of IXC's OC-48 fiber-optic network in exchange for 20% of PSINet's stock. IXC also will market PSINet's services to its customers. USinternetworking is a holding company being formed by Christopher McCleary, formerly CEO of Digex, Inc. PSINet's board of directors rejected McCleary's bid of $10 per share.*

© PSINet: (703) 904-4100

GRIC's *Oswold*

■ **GRIC Communications, Inc.** *(formerly AimQuest Corp.) is making Microsoft Corp.'s Internet Connection Services for Microsoft Remote Access Services software available to its GRIC alliance partners. GRIC is a conglomeration of Internet service providers that offers worldwide Internet roaming. GRIC has added Microsoft's software to its authentication server package. Microsoft's package supports the Point-to-Point Tunneling Protocol.*

GRIC also appointed Tom Oswold as chief financial officer. Oswold comes from Silicon Graphics, Inc., where he was vice president of finance and treasurer.

© GRIC: (408) 955-1920

■ **Infonet Software Solutions** *(ISS) last week introduced MailMail, a service that lets users access e-mail and files via a Web browser. Customers can upload any files they want to access remotely to a MailMail server.*

The service can be sold by Internet service providers, and ISS recommends a monthly fee of $4.95 per customer over the price of Internet access.

© ISS: (310) 335-1144

Crowe betting $3 billion on the 'Net

Monster IP network to blend with today's public Internet.

Q&A James Crowe, the tough-minded CEO who built the former MFS into a plum that WorldCom, Inc. bought for $14 billion in 1996, believes the Internet is the network of the future. And he is sure it will improve as independent carriers with high-capacity networks and careful traffic management blend their resources into the mix of networks that is the Internet.

Crowe now leads Level 3 Communications, Inc., a planned IP voice, data and video fiber-optic network already backed by $3 billion in assets from Kiewit Diversified Group, of Omaha, Neb. He recently talked to *Network World* Senior Editor Tim Greene about the future of Level 3 and the 'Net.

How did you come up with the idea for this new network?

Back in 1995, we were merrily building at MFS a fiber-based circuit-switched global network.

Then, for a variety of reasons, we started looking at IP and the Internet. The more we looked, the more we came to the conclusion that business-oriented [Internet service providers] were in the same business as MFS; they just had a technology that was more cost-effective for lots of stuff in 1995 and was improving far more quickly than circuit-switched technology.

You seem to rely on upcoming technology to provide quality of service, right?

There is technical development needed. But there is also the process of showing customers that our business practices are such that we can be trusted with valuable mission-critical information.

So you will use the Internet as part of your backbone?

No one has a high-speed connection to everywhere. If [carriers do not] have a high-speed connection to Omaha, they dump it to somebody else who comes here. Do they use the Internet for their backbone? Yes, for some of their customers.

So you want to be an integral part of the Internet, only make it more responsive?

That's a good way of putting it.

When you are up and running, you won't be selling frame relay service, for example, you'll be selling IP tone?

When we're up and running, I would hope you would say, 'Why would I want to buy frame? I can buy the same service on an IP backbone at a lower cost with the kind of quality and reliability I need.' The job that we have is to make certain that our business customers trust us.

What services will Level 3 offer?

Today, as we speak, IP-based networks are suitable for [data traffic].

Over the next couple of years, we fully expect to see deployment of technologies that allow us to handle voice and video — tag switching, et cetera.

Can you describe what your network hardware will look like beyond being based on data communications technology?

Our goal is to build a network that can accommodate unpredictable technical change, if not elegantly, then more elegantly than our competitors.

We think the road is littered with people who took a religious view of technology and then got surprised. ■

Pilot is looking for e-commerce dance partner

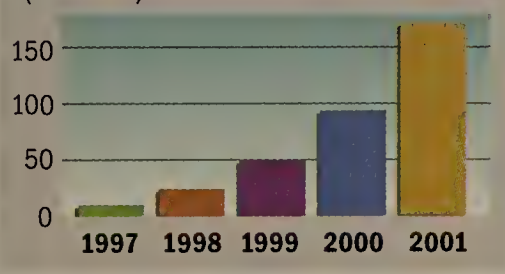
By Denise Pappalardo
Alameda, Calif.

Pilot Network Services, Inc., an Internet service provider that specializes in security, is looking to partner with other carriers in the hopes of expanding the reach of its secure electronic commerce offering.

THERE'S MONEY TO BE MADE

The value of electronic commerce over the Internet is expected to explode by the turn of the century, according to a recent study conducted by International Data Corp.

Internet-based electronic commerce revenues (in billions)



Late last year, Pilot announced its Electronic Commerce service that, like the rest of the company's services, is guaranteed to be secure. Pilot uses a mix of its own dynamic firewall technology, Open Market, Inc.'s Transact software and around-the-clock surveillance to deliver the service.

Now Pilot is trying to convince AT&T, MCI Communications Corp. and Sprint Corp. to resell the service, said Marketta Silvera, CEO of Pilot, based here.

Pilot's plan is to strike partnerships under which Pilot would set up a data center at a telephone company's central office site. This would allow the partner to offer its customers Pilot's electronic-commerce platform.

However, Pilot may have a hard time selling its services to telcos and ISPs that view the company as a competitor.

"We have our own strong suite of e-commerce applications, so I don't think we would look at [Pilot's] offering," said Kate Dotson, director of application business development at GTE Internetworking.

But some carriers might partner with Pilot to tap its expertise in providing premium-security services to enterprise customers, said Rebecca Wetzel, director of Internet services at TeleChoice, Inc., a Verona, N.J.-based consulting firm.

It would be "like having Fort Knox on your side," agreed Dan Taylor, senior analyst at Aberdeen Group, Inc., a Boston-based consulting firm.

Unlike other managed offerings based on standard firewalls, Pilot's Secure Electronic Commerce service is unique because it is delivered using Pilot's dynamic firewall technology, Taylor said.

Whereas most service providers occasionally distribute firewall software updates, Pilot's devices are continually updated automatically.

Pilot has five data centers around the country, with one opening in London this quarter. If a data center has 20 firewall servers and a hacker attempts to break into one, all of the firewalls across the company are updated about the methods used. This makes the firewalls better at fighting off intrusions, Silvera explained.

Pilot expects to announce electronic commerce service partnerships by midyear.

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WAN MONITOR

What customers want and how ISPs stack up

These days, if you have the misfortune of selecting the wrong Internet service provider, you've got headaches Tylenol can't touch. That's one reason TeleChoice recently conducted a survey to evaluate ISPs.

This is the first comprehensive survey to ask IT managers what they look for in an ISP and how the major ISPs stack up.

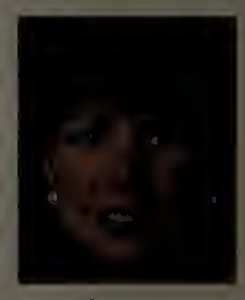
The survey also sought to find out which customers are planning to change ISPs and why, and to determine what value-added services business customers are looking for.

Almost unanimously, survey respondents cited service reliability as the most critical factor in selecting an ISP.

Placing a close second in importance is service performance, such as delays, packet loss and capacity. Speedy problem diagnosis and repair came next, followed by competence and knowledge of customer service and technical support.

The big question: How did the ISPs stack up? The overall winner according to the survey was UUNET. AT&T finished second, followed by GTE Internetworking, formerly BBN Planet. Relative newcomer MindSpring deserves honorable mention for fourth place.

GTE Internetworking was judged by the highest percentage of respondents as among the best in the industry for service reliability. GTE Internetworking's reliability rating was closely followed by UUNET's.



Daniel Briere and Christine Heckart

Interestingly, regional Bell operating companies as a group rated third. MindSpring won top honors for pricing and service levels. MindSpring seems to have found a formula for offering excellent service at very competitive prices, which puts it in a strong position with price-sensitive small businesses.

UUNET tied with the RBOCs for best in service performance. GTE Internetworking and AT&T also stood out from the pack as providing outstanding service performance.

The fact that GTE and AT&T were neck and neck probably reflects the fact that BBN Planet was under AT&T's watchful eye at the time of the survey. Next year when we redo the survey, we expect things could look different with AT&T's own engine driving its services.

You can check out the scores for 11 of the major U.S. ISPs on our Web site at www.telechoice.com/hot/ispbrief.html.

Details about how customers are using the Internet, what new services they want from service providers and who plans on making changes to their ISP in the next six months are available in the full report.

The information in the survey also is intended to help your service providers create new offerings to better meet your needs. And because this survey will be an annual event, we'll be able to keep you posted on which companies are keeping pace and which are losing the race. Stay tuned.

Briere is president and Heckart is vice president with TeleChoice, Inc., a consultancy in Verona, N.J. They can be reached at dbriere@telechoice.com and checkart@telechoice.com.

Briefs


EMA's *Stackpole*

■ **The Electronic Messaging Association's (EMA)** *board of directors has chosen* **Kerry Stackpole** *to be the organization's president and CEO. Stackpole, a member of the American Society of Association Executives board of directors, was president of the Boston-based Association for Work Process Improvement.*

© EMA: (703) 524-5550

■ **Intershop Communications, Inc.** *next month will release the third version of its* **Intershop electronic commerce storefront.** *The new version includes load-balancing and "hybrid HTML" for storing display pages as static files on the hard drive, rather than compiling them on the fly each time they are called.*

© Intershop: (415) 373-1530

■ **Ariba Technologies, Inc.** *today began shipping the third version of its business-procurement software* **Operating Resource Management (ORM),** *a package designed for corporate buyers.*

Written entirely in Java, ORM 3.0 supports integration with SAP AG's Enterprise Resource Planning System, automatic reconciliation of procurement card purchases and a way to synchronize a seller's Web-based catalog or spreadsheet information with the buyer's catalog.

Pricing starts at $750,000.

© Ariba: (408) 543-3800

■ **VirtuFlex Software Corp.,** *an* **extranet software start-up,** *has named former Software House executive Chris Heidelberger as CEO. He replaces Ronald Schmelzer, who co-founded the Cambridge, Mass.-based company in 1994. Schmelzer will continue as chief technology officer.*

It's almost IPO time for digital certificate vendors

By Ellen Messmer

Digital certificates for signing electronic messages are not yet mainstream, but that is not going to stop two vendors involved in the business from going public later this year.

Entrust Technologies, Inc. and VeriSign, Inc. each plan to issue stock to raise money for their public-key certificate issuance and management ventures.

Although their initial public offerings (IPO) could happen at nearly the same time, the digital "cert" vendors have totally different models of operation — and, apparently, balance sheets.

Entrust began at Canada's Northern Telecom, Ltd., which a year ago spun off its Secure Business Networks unit to sell its flagship Entrust server product.

Under the Entrust approach, an organization declares itself to be a certificate authority and issues public-key X.509 digital certificates to let users digitally sign electronic messages and files. The X.509 certificate links the user's identity to a public/private encryption keypair.

Entrust sells its digital cert management software and tool kits directly into the government and corporate sectors.

VeriSign, in contrast, has adopted a service model in which it issues different types of low-assurance or high-assurance client or server certs — such as its Financial Server ID and the EDI Server ID. VeriSign claims that since 1995 it has issued certificates for 35,000 Web servers and 1.5 million individuals for use with browsers, e-mail and electronic data interchange.

Many of these certs were at first giveaways; Netscape Communications Corp. Chief Technology Officer Marc Andreessen once proclaimed digital certs to be "the driver's license of the Internet." In some cases, VeriSign required no particular proof of identity before issuing low-assurance certs online.

But lately VeriSign has won more paying corporate clients, NationsBank Corp. for one, to which it is supplying digital certs based on the bank's own identity checks.

To date, VeriSign's biggest paying customer appears to be Visa International, Inc., which accounted for 21% of VeriSign's sales in 1996 and 16% in 1997. But according to the VeriSign prospectus filed at the U.S. Securities and Exchange Commission, the company has accumulated $25 million in losses.

Although Entrust has not yet filed for an IPO, Entrust President and CEO John Ryan told *Network World* the company intends to go public later this year. Ryan also said Entrust had gross revenues of $29 million in 1997, and $26 million in 1996, "and we were profitable — with low double-digit profitability — every quarter."

Despite VeriSign's red ink, it is showing signs of being a scrappy competitor. When NationsBank asked for competitive bids for its digital cert request for proposal last summer, VeriSign beat out CertCo LLC, Entrust and IBM, among others, with a low-cost bid and technology that impressed the bank.

NationsBank MIS Director Roger White said digital certificates are the primary security component the bank will rely on in Web-based transactions, but he still has concerns about the technical and policy challenges of managing certificates. ■

Two "public-key infrastructure" outfits will go public this spring

Company:	Entrust Technologies, Inc.	Verisign, Inc.
Founded:	January 1997	April 1995
Headquarter:	Dallas, TX	Mountain View, CA
Number of employees:	250	162
1997 revenues:	According to CEO John Ryan, Entrust made $29 million in gross revenues and is "profitable"	SEC filing shows $6.1 million in revenue and a $12.7 million loss for the nine months ending September 1997

Eprise lets non-techies tweak Web applications

Participant Server lets users define roles and responsibilities.

By Paul McNamara
Framingham, Mass.

NovaLink USA has a new name, new server software and a spanking new buzzword: participant management.

What is participant management? Software that lets ordinary users of Web applications define who has the authority to do what and determine what information each user can get.

Now called Eprise Corp., the Web site developer last week announced its Participant Server software, which offers these so-called participant management features by combining personalization, content management and security capabilities into a single framework. No special client software is needed because users access the server via a Web browser.

But just who is a participant? According to company officials, any person who comes in contact with an application, be they a manager, contributor or just a visitor, is a participant.

A company using Participant Server could, for example, assign different Web site personalization capabilities and content management authorities to different department managers, business partners or even customers.

Nexar Technologies, Inc., a PC maker based in Southborough, Mass., is doing just that, according to Michael Agby, channel marketing manager at Nexar.

"We are able to keep one point of [approval] for everything before it goes live, but we still allow 10 or 12 people to oversee each particular area of the company site," he said.

Participant Server supports Microsoft Corp.'s Internet Information Server and Netscape Communication Corp.'s Enterprise Server; the two major Web browsers; and Oracle Corp., Sybase, Inc., and other SQL-based databases.

Expected to ship by the end of this month, Participant Server will be priced starting at $10,000 per server. Cost of the typical installation, including software, documentation, training, support and application services, will range from $40,000 to $80,000, the company said.

© Eprise: (800) 274-2814

PROFILE: EPRISE CORP.

Headquarters:	Framingham, Mass.
Founded:	1992
Key executives:	Joe Forgione, president and CEO, who recently joined the company after leaving Lotus; Jon Radoff, chairman and chief technical officer
Main product:	Eprise Participant Server, software used to define and manage the roles and responsibilities of Web application users within and across organizations

'NET INSIDER

A familiar song

I wonder just why the recent announcement about the Baby Bells deciding to follow the asymmetric digital subscriber line star has received so much press.

I've heard the ADSL technology and product plan song before — it just never quite seems to get to the point where real users join in the chorus.

One question I have is about the technology itself. It is good stuff. It can run fast over existing copper phone lines, assuming that your site meets the distance and cable path restrictions. But should this have been enough to warrant a front page story, above the fold, in *The New York Times* and extensive coverage in *The Wall Street Journal* last month?

ADSL is not a quantum leap over already deployed technology such as cable modems. I've been a happy user of a cable modem Internet service for a number of years. It performs very well — I can transfer files from my office to my home at 1.3M bit/sec and send them the other way at 224K bit/sec (my cable modem service also features asymmetric bandwidth).

The service has proven to be extremely reliable, with less than two hours of unplanned outage over the past year.

The service also is quite popular. @Home, one of the service providers, announced surpassing 50,000 subscribers the day before word of the Baby Bell ADSL announcement leaked out in the *Times*. @Home's number is quite small when compared with UUNET's subscriber numbers, but @Home's subscriber base is more than 11 times that of the current ADSL subscriber base, according to the *Journal*.

And the cable modem-ready cable infrastructure is growing rapidly. MediaOne — my provider — already offers cable modem service in 55 communities with a total of about 500,000 homes in eastern Massachusetts and southern New Hampshire.

Scott Bradner

Some people worry about cable modem security, given that cable modem services operate as shared LANs.

I do not consider this to be a major problem, since I use application level security, such as Secure Shell and secure Web browsers, which encrypt the data stream.

In addition, ADSL is not all that different on the security front in that ADSL conversations typically traverse a shared Internet service provider infrastructure on their way to a shared LAN at the destination.

But even the security issue cannot explain the level of press coverage.

Yes, some other big companies — Microsoft, Intel and Compaq — are associated with the Bells' plans, but these other companies make significant announcements almost daily that rarely get this much coverage.

I think the reason that the announcement got such prominence is because a lot of people in the press still don't quite think that the Internet is real. For years they have been expecting that the real Internet would happen when the regional Bell telephone companies decide to join in.

Every time that a Bellette mumbles anything about the Internet, these press people take it as a sign from heaven that the real Internet may show up soon. Someday they just might notice that it is already here.

Disclaimer: Harvard's grasp of reality varies, but the above are my observations.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.

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Ron Nutter, a Master Certified Novell Engineer and Groupware CNE in the Lexington, Ky., area, tracks down the answers to your questions. Call (800) 622-1108, Ext. 7476, or send your questions to rnutter@world.std.com.

I have a server with a Mylex Corp. motherboard and SCSI RAID controller connected to a RAID subsystem from Digital Equipment Corp. The server is working fine, but I'm having trouble with a backup server that I want to connect to the RAID box. The server uses a spare Mylex controller, but the motherboard is from Diamond Flower Electric Instrument Company, Inc. (DFI), not Mylex.

For some reason, after I connect and configure everything and the controller sees the RAID box, the network operating system loads but then abends while mounting the volumes for about 15 minutes after the server comes up. Does NetWare need something that is specific to the motherboard?

Via NW Fusion

Either motherboard should work. To figure out the cause of the problem, first put the RAID controller in your primary file server. If everything works fine there, the problem is probably due to some type of hardware conflict between the DFI motherboard and the Mylex controller. The abend message on the file server console screen might provide hints to the problem's cause. In addition, for the controller check with the Mylex support folks to see if they know of any problems or if they have new drivers.

Look at the differences between the motherboards to see if disabling the onboard cache helps resolve the problem. Look at where the memory is mapped in the server to see if there is some type of memory overlap that the "Post" process on the server isn't catching when it powers up.

Just in case you haven't already done so, some of the basic troubleshooting steps that have served me well in the past may help with your situation. For example, check Novell, Inc.'s Web site, http://support.novell.com, to get the latest drivers for your version of NetWare and to verify that you have the latest version of CLIB on your server.

How to use the network as a storage device

By Larry Kallhof

Network and server downtime is costing companies hundreds of thousands of dollars in business and productivity losses. At the same time, the amount of information to be managed and stored is increasing.

A new concept called the Storage Area Network (SAN) could offer an answer to the increasing amount of data that needs to be stored in an enterprise network environment. By implementing a SAN, users can offload storage traffic from daily network operations while establishing a direct connection between storage elements and servers.

Building a SAN requires network technologies with high scalability, performance and reliability in order to marry the robustness and speed of a traditional storage environment with the connectivity of a network.

As the SAN concept has developed, it has grown beyond identification with any one technology. In fact, just as LANs use a diverse mix of technologies, so can SANs. This mix can include FDDI, ATM and IBM's Serial Storage Architecture, as well as Fibre Channel. SAN architectures also allow for the use of a number of underlying protocols, including TCP/IP and variants of SCSI.

A SAN allows different kinds of storage — mainframe disk, tape and RAID — to be shared by different kinds of servers, such as Windows NT, Unix and OS/390. With this shared capacity, organizations can acquire, deploy and use storage devices more cost-effectively. SANs let users with heterogeneous storage platforms utilize all of its storage resources.

This means that within a SAN users can backup or archive data from different servers to the same storage system; allow stored information to be accessed by all servers; create and store a mirror image of data as it is created; and share data between different environments.

By externalizing storage and taking storage traffic off the operations network, companies gain a high-performance storage network, shared yet dedicated networks for the SAN and LAN, and improved network management. These features reduce network downtime and productivity losses while extending current storage resources.

In effect, the SAN does in a network environment what traditionally has been done in a back-end I/O environment between a server and its own private storage subsystem. The result is high speed, high fault tolerance and high reliability.

With a SAN, there is no need for a physically separate network because the SAN can function as a virtual subnet operating on a shared network infrastructure, provided that different priorities or classes of service are established. Fibre Channel and ATM allow for these different classes of service.

Early implementations of SANs have been local or campus-based.

But as new WAN technologies such as ATM mature, and especially as class-of-service capabilities improve, the SAN can be extended over a much wider area.

Despite the hype about the coming of unlimited bandwidth, WAN services remain costly today. However, as WAN technologies improve their quality of service, they will provide the robustness needed for each application, including networked I/O, even over public WANs.

SAN tools

In addition to reliability and performance, SANs promise easier and less costly network administration. Today, administrative functions are labor-intensive and IS organizations typically have to replicate management tools across multiple server environments. With a SAN, there is just one set of tools and replication costs can be avoided.

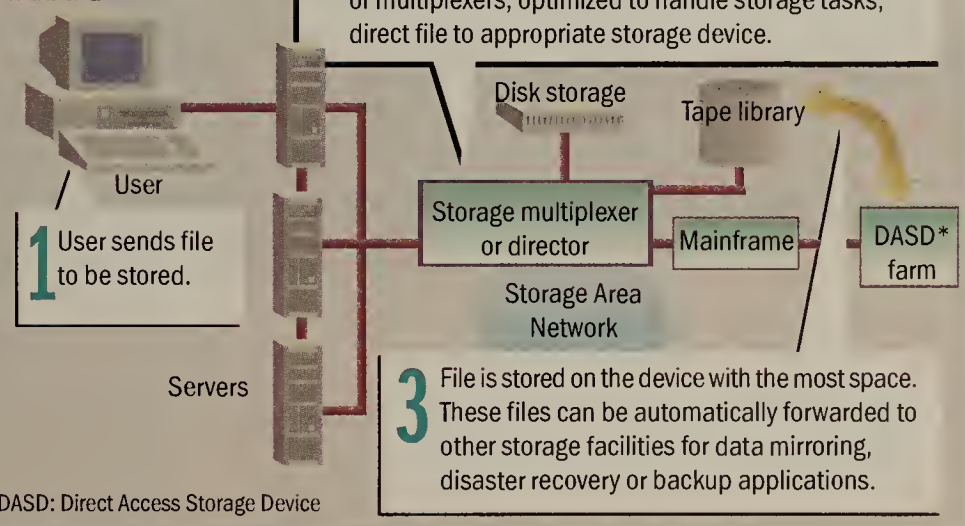
The traditional software functions of security management, access control, data management and storage management will be mapped into the SAN architecture and performed differently than they have been in the past. For example, different security strategies have to be pursued when storage devices are more widely available. Specialized I/O protocols such as Network Data Management Protocol are emerging, and the software functions will evolve much as LAN functionality has progressed in recent years.

Kallhof is director of product marketing in the Enterprise Systems division of Computer Network Technology Corp. (CNT). CNT is a mainframe connectivity vendor, and also builds storage-area technology products. He can be reached at (612) 797-6000.

HOW IT WORKS

Storage Area Network

A Storage Area Network (SAN) is really nothing more than a separate network to handle storage needs. The idea is to untie storage tasks from specific servers and enable a shared storage facility that uses high-speed network technologies as a backbone.



*DASD: Direct Access Storage Device

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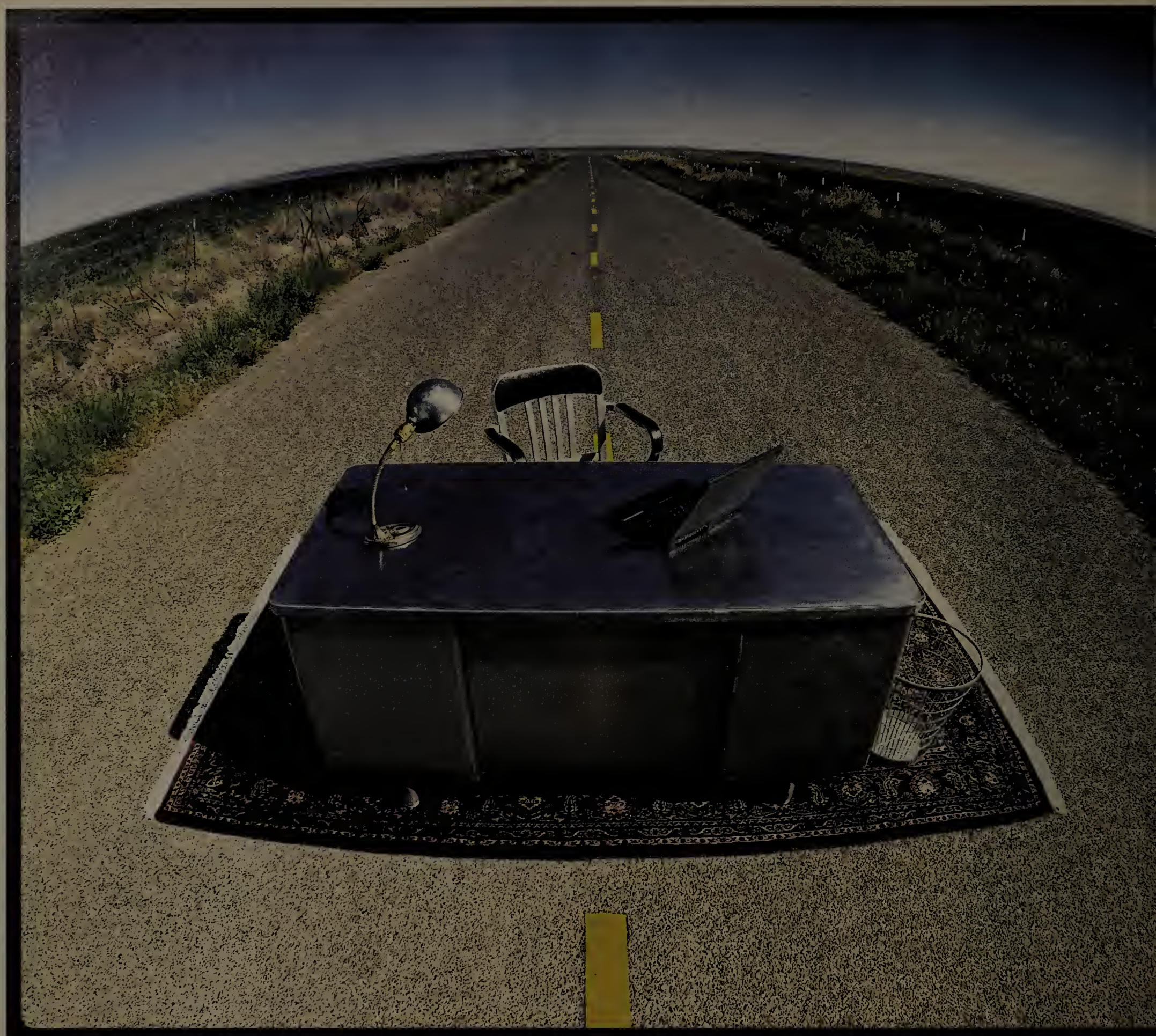

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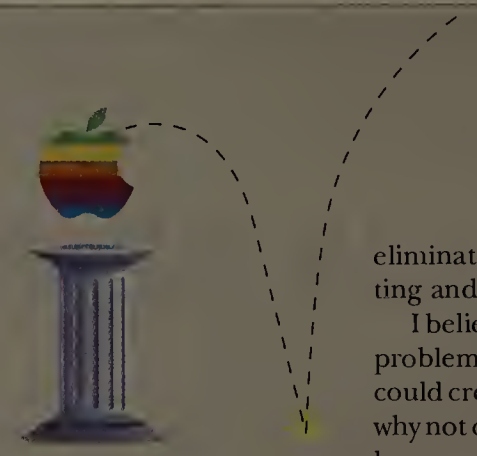
EDITORIAL *insights*

My plan for a Mac comeback



Should Steve Jobs take the CEO position at Apple? Can the company continue its financial upswing? How can it keep its installed base happy? You hear these questions all the time.

So what is our obsession with Apple anyway? The last time I checked, its influence on the PC industry was waning and its impact on networking was minimal at best.

Nevertheless, I'm in there among the Apple believers, hoping upon hope that Steve Jobs will ride in on his off-white steed and save the company from nonexistence. But the comeback plan has got to be innovative and has to embrace the language of the future: Java.

That said, the company has many obstacles to identify and overcome. First, Apple has to lower the comparatively high cost of owning Macs. Between expensive hardware and a dearth of applications that keep Mac software more expensive than their PC counterparts, IS managers have a tough time justifying Mac purchases.

Next, the company needs to help IS managers by making Macs, in a PC-laden environment, easier to install and maintain. Also, minimal training should be required to handle the differences between the environments.

Finally, Apple should enable Mac end users to share documents and files and collaborate with PC devotees more easily. Apple must eliminate all the wrestling with formatting and transfer problems.

I believe the answer to all of these problems is simple: cater to Java. Apple could create a Java-based Mac (heck, why not call it the Java Mac, as my colleague suggested), which could act as a stand-alone computer or run applications off of a server. Mac lovers could keep the user-friendly environment they've come to trust, but actually move forward by employing next-generation technologies.

And since Java is *the* language that software developers are moving toward, there would be an abundance of applications available for Mac users, inevitably driving down software costs. Better still, these applications, being Java-based and not Windows- or Mac-specific, would be virtually seamless in their interactions, allowing users to share files and collaborate transparently.

If Apple were to accept this technology and evangelize it as it did AppleTalk in the late '80s, it would find a whole community of Mac lovers waiting to welcome a Mac back to their desktops. Perhaps Apple would even find net administrators ready to accommodate them.

Sandra Gittlen, online reporter sgittlen@nww.com

Network Management • Richard Ptak

Don't fall prey to the desktop mgmt. food chain

Nature teaches us the inevitability of the food chain, in which dominant predators survive at the expense of lower life forms. Competitive capitalism works in much the same way: Smaller players should beware when the heavies start eyeing their market niche — in this case, desktop management.

Until the middle of last year, vendors such as Bull HN Information Systems, Computer Associates, Hewlett-Packard and IBM/Tivoli paid little attention to desktop management.

Instead, they were fighting to dominate the enterprise network and distributed server management arenas. All four vendors provided desktop solutions, but as a check-off item, not a heavily promoted strategic direction.

Indeed, conventional wisdom held that Microsoft would largely determine the fate of desktop management, leaving only scattered leftovers for the losers. However, this scenario lost credibility as the limited focus of Microsoft's management products became increasingly apparent. Consider that the top three desktop management functions are applications management, configuration management and virus checking. Microsoft's Systems Management Server only reluctantly acknowledges (and manages) other vendor's products. Intel, not Microsoft, owns the configuration management space; Symantec and McAfee Associates lead desktop virus management.

Meanwhile, sleeping giants CA, HP and Tivoli awoke and realized that consolidated desktop management offered an ideal opportunity for differentiation. Specifically, the players focused on desktop management products with built-in, enterprise-level scalability. Sufficiently feature-rich enterprise solutions could replace current LAN management suites in one fell swoop.

CA, HP and Tivoli began targeting this niche — CA with its MERIT project to identify missing enterprise desktop functionality and its Enterprise/CSi product; HP with its Desktop Administrator, a desktop manager fully integrated with an enterprise-level management platform; and Tivoli with reinvigorated promotion of its MultiPlatform Manager initiative and LAN Management modules for integrating enterprise and desktop solutions.

Today's enterprise solutions fall short in desktop management because of their historical scalability/functionality trade-off. Enterprise management solutions have the scalability to replace desktop suites, but not the features. While enhancement efforts have started, expect gaps through at least late 1998.

However, it's clear that enterprise management vendors view the desktop as their next big cash cow. Pursuing this trend will push desktop management suites out of lucrative large corporate accounts, leaving the suite vendors to fight over small-to-midsize firms. Suite makers that read the writing on the wall will either change and grow their solutions (for example, the McAfee/Pretty Good Privacy/Network General merger) or get crowded into an even rougher, margin-thin niche.

What does this mean for you? On the upside, look for increased functionality in scalable solutions and real cost savings as competition for your business becomes increasingly cutthroat. On the downside, internal IT power struggles could emerge as LAN administrators fight enterprise-based administration to retain power and job security.

Before selecting an enterprise-level desktop management solution, identify and prioritize short- and long-term management requirements.

What functions and information are required at the local and enterprise levels? What level of integration is required between the levels? Can the vendor deliver the required integration with your installed or preferred enterprise platform?

Addressing questions like these beforehand may keep you from becoming a victim of the food-chain phenomenon.

Ptak is director of systems management research for D.H. Brown Associates, Inc., an industry research and consulting firm in Port Chester, N.Y. He can be reached at rlptak@dhbrown.com.

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, *161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.*

Hire education

Regarding Frank Schoff's column "Strong job market leads to some strange behavior" (Dec. 15, 1997, page 44):

While it's fun to tell stories about oddball job candidates, Schoff goes too far when he turns serious and advises hiring managers how to avoid recruiting problems. Managers who follow all of his advice will drive away many good candidates.

Schoff tells managers to demand formal documentation of applicants' salary histories. I advise applicants not to reveal their old pay at all. A firm should offer to pay a new hire what the job is worth, not

XML cooks up no-fuss e-commerce

Surprisingly, there has been little overlap so far between the traditional world of business-to-business electronic data interchange (EDI) and the newfangled terrain of Web-based electronic commerce.

One of the hallmarks of traditional EDI — widespread use of standard data-interchange formats known as transaction sets — has been almost entirely absent from today's HTML-oriented electronic commerce applications. The new wave of electronic commerce is based on a profusion of HTML-based, application-specific electronic forms. Unlike established transaction-set formats such as ANSI X12 and EDI for Administration, Commerce and Transport (EDIFACT), HTML forms have no facility for defining the precise role, meaning and structure of each data element they contain.

Without universal data-semantics conventions such as ANSI X12 and EDIFACT, business-to-business EDI would grind to a halt as trading partners disagreed on the legal interpretation of fields in electronic documents, such as purchase orders and bills of lading. Moreover, the cost of developing and maintaining EDI applications would be exorbitant because programmers would not be able to rely on standard schema for parsing inbound transmissions into discrete documents, records and fields.

HTML is a flimsy basis for sophisticated EDI. It requires an elaborate set of scripts and applets to define and extract the data elements, attributes and values in a forms-based transaction set downloaded to a browser. Even the vaunted Dynamic HTML technology does not do much to address EDI data-processing requirements, because, like HTML, it was designed principally for data presentation and display.

Fortunately, the World Wide Web Consortium (W3C) has defined and is on the brink of ratifying a successor format for tagging data objects within Web pages. This format, known as the Extensible Markup Language (XML), will allow Web developers to define flexible object-oriented document formats for diverse applications that can be browsed, queried and processed more efficiently than today's flat HTML data structures. Microsoft's Internet Explorer 4.0 already supports XML, and Netscape Communications has promised to include support for it in the next Navigator upgrade.

Some groups have proposed using XML to encode EDI transactions sets. Most noteworthy among these is the XML/EDI Group, a Washington, D.C.-based industry organization that has posted its draft "Guidelines for Using XML for Electronic Data Interchange" on its Web site (www.xmledi.net).

One of the truly exciting things about the XML/EDI Group's initiative, if it ever results in a full-fledged standards suite, is that it would allow a complete set of EDI business rules, document templates, processing software, workflow status and supplementary data — or hyperlinks to all of the above — to be transmitted along with the transaction sets. This would allow new Web-based EDI trading partners to interface their internal systems rapidly to existing interorganizational workflows, based on industry-standard message formats and process models downloaded in or linked to XML documents. In EDI parlance, trading-partner implementation agreements could come prepackaged with the transactions the partners plan to use, providing first-time partners a no-fuss, no-muss entree to electronic communications.

All of this, of course, is easier specified than done. The XML/EDI Group has bitten off a big agenda of wannabe standard or implementation initiatives, such as standardizing syntax, document-type definitions and field-definition dictionaries associated with XML-encoded EDI transaction sets.

Rewriting EDI transaction sets with XML in mind may take years, given the need to square this effort with the ANSI X12 and EDIFACT standards bodies, as well as the W3C. Thousands of existing transaction-set standards would need to be recoded — a highly political endeavor that could take years and slow the momentum of the XML/EDI Group effort.

There already is widespread industry support for the concept of XML-based EDI standards, which means the standards bodies should put this effort on their fast-track agendas. When XML becomes a firm standard, organizations using EDI should organize limited extranet pilots and trials that use the standard to envelope standard transaction sets with a range of metadata and hyperlinks to back-end databases.

Once you see the power of XML encoding to pluck relevant EDI data from Web pages and legacy systems, you'll see that it truly does represent the future of data-rich Web application development.

Kobielus, a contributing editor to Network World, *is a senior telecommunications analyst with LCC International, Inc., a McLean, Va.-based network design, engineering and integration firm. He can be reached at (703) 873-2474 or at kobielus_james@lccinc.com.*

some function of his or her old pay. Discussing a target pay range is sufficient.

Schoff says managers should distrust any candidate who wants more than two weeks (less travel) between taking an offer and reporting to work.

That ignores the happy tradition of taking a usually long-postponed vacation before starting a new job — R&R which will allow the new staffer to show up fresh and happy instead of burnt out and surly. Also, it punishes conscientious professionals who wish to give their old employers more than 10 days' notice.

Schoff says "finding the right people is only half the problem." He thinks the other half is dealing with candidates' bad behavior. I think the other half really involves striking a fair bargain with those "right people" you do find. Most network professionals will respond instinctively to fair bargaining with good faith and the kind of performance and loyalty employers should seek.

Mark Seecof
Consulting network architect
San Diego

Schoff responds: A compensation offer is based on three factors: the current market value of your skills, how strongly the company feels about you as an individual and your current compensation.

Given the strong job market for technology professionals, the first two factors are the most critical. However, refusing to disclose your current compensation introduces unnecessary tension by raising suspicions that you are not communicating openly.

I have never had an employer object to extending a start date to include a vacation. However, those who find it difficult to leave their present job, for any reason, have not made the critical emotional transition to the new employer and may never show up.

Hypocrisy response

Regarding your editorial "Readers react to hypocrisy charge" (Jan. 12, page 34):

On the issue of browsers, I am not a hypocrite. I have always used Netscape and will continue to do so, even if I have to continue to pay for it. It is faster and easier to use than Internet Explorer.

On the Justice Department's browser case, the court should rule that Microsoft remove all browser components from the operating system, even if this delays the OS release into the year 2000, or make it equally easy to choose and install another browser. If Microsoft wants Windows to use a browser model, fine, but I should be able to choose which browser.

Mark Hamilton
Leavenworth, Kan.

FIND IT ON FUSION 5613
Go online for more reader reaction to the hypocrisy charge.

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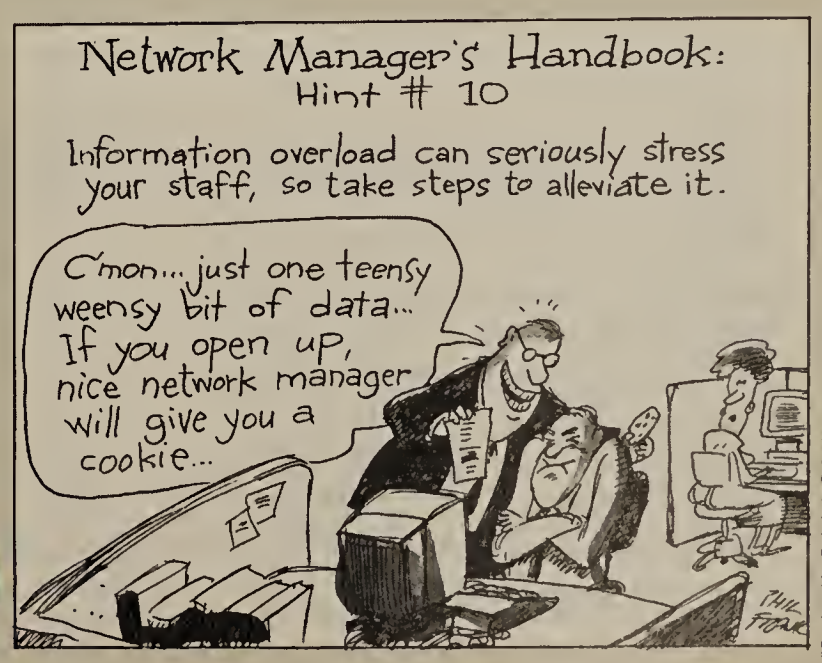

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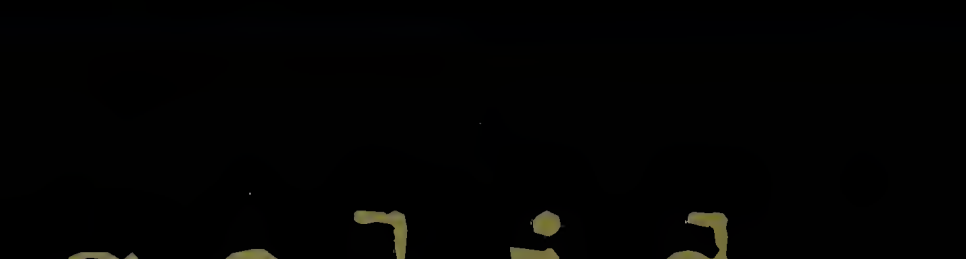

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Anatomy of a Friendly Hack

ILLUSTRATIONS BY MARCOS SORENSEN

How to assess your enterprise security, correct vulnerabilities and thwart attacks.

By Winn Schwartau

This story is based on an actual experience with a client in the banking industry. Names and other details that could reveal the client's identity have been changed, but the story is otherwise accurate.

James Fallsworth, vice president of corporate security at Big American Bank, was in a panic. He had just learned that the bank soon would debut a suite of Web-based remote banking services for seven million global customers. BABank Online would let customers access their accounts, make payments and transfers, and remotely manage their finances.

Incredulous that he wasn't previously informed about a technical move rife with staggering security implications, Fallsworth was in a quandry. The beta program already had begun and the new online services would be globally deployed in less than two months. BABank's president assumed Fallsworth had been in the loop and asked him to handle the situation.

Fallsworth quickly needed to know how secure BABank Online was. Break-ins or even Web graffiti would undermine customer confidence in the service and diminish the bank's revenue and profit. It didn't take long for him to decide what to do: Hire a company to test the external security controls of the bank and determine the company's real vulnerabilities.

Once Fallsworth hired our firm, we worked

SECURITY ALERT:

The FBI is investigating more than 700 major incidents of foreign intelligence operations in the United States. Foreign agents' spying techniques include wiretapping, bugging offices, capturing cellular phone conversations, penetrating computer networks and stealing proprietary information from disks and CD-ROMs, among others.

Ten ways to protect your Web commerce sites

1. Limit the number of people who have remote access to your Web site for administration purposes and manage this process closely. Remote administration — the equivalent of root access — gives hackers a great opportunity to sneak in.

2. Make sure your access control lists are properly configured and constantly updated to reflect the day-to-day needs of your business, such as adding new employees and customers and deleting old ones.

3. Isolate your commerce server from as many services as possible to avoid vulnerabilities. Harden the server by closing down all extraneous features in the applications and operating system. If you can't do this, seriously consider outsourcing.

4. Implement an intrusion detection system that immediately alerts managers of problems that need to be corrected. After all, detecting a hacker does nothing; stopping him is the goal.

5. Make sure your intrusion detection software looks for anomalous behavior on your servers. You can't stop the bad guys if you can't see what they're doing.

6. Perl and Common Gateway Interface scripts can cause security holes if they're improperly written, configured or installed. Use these development tools sparingly and make sure experienced developers test them.

7. Passwords just aren't strong enough for some commerce sites. Consider giving customers physical and electronic tokens that cost about $50 each.

8. Likewise, you want to make sure administrators who have root authority are who they say they are. Biometric solutions to identify voice, fingerprints or retinas are moving to the masses at a cost of roughly $300 per user.

9. Your site relies on other networks and systems to move money, whether it accepts credit cards or uses a mainframe to complete remote banking transactions. Use secure agents such as Secure Sockets Layer, Secure Hypertext Transfer Protocol or Kerberos to communicate with critical systems.

10. Think about installing integrity wrappers around critical data and related system files. Cryptographic seals around these files prevent modification or the introduction of malicious code.

— Winn Schwartau

together to understand the goals of the penetration testing, also known as a friendly hack. These goals included assessing the integrity of the new services and how they relate to the rest of the bank's operations; determining what vulnerabilities exist; offering solutions to boost security; and demonstrating the possibility of losses due to system intrusion.

Chart the method of attack

When you plan security assessments and simulated attacks against your company, you need to identify potential perpetrators. Most companies view the bad guy as a professional criminal, foreign national, spy, competitor, terrorist or maybe just a 16-year-old with a keyboard. After Fallsworth identified international criminals with profit motives as the likely enemy, we decided how we would carry out the friendly hack on BABank's networks and Web sites.

SECURITY ALERT:

Foreign spies from at least 23 countries have stepped up their attacks against U.S. corporations. Intellectual property losses in the United States for 1997 alone may have exceeded $300 billion, according to the FBI.

Naturally, it's important to understand how far real hackers might be willing to go to penetrate your network. Social engineering is a tactic for acquiring information that can be useful in compromising the defenses of a company under attack. This could take the form of anything from a friendly telephone query about a new mainframe service pack to a probing inquiry of specific security operations.

Dumpster diving is another common dirty trick. All too often, a company's garbage contains a gold mine of customer information, internal phone directories, technical documentation, disks and other resources.

In addition to gaining access via telephone systems, maintenance ports and any other electronic doors we could find, we deemed phone-based social engineering, posing as an employee or supplier over the phone, and dumpster diving off the bank premises as fair game for the simulated attack.

Mail-based social engineering, on-site dumpster diving, posing as an employee on-site and penetrating business partners were off limits, along with more nefarious methods such as extortion, blackmail, coercion and investigating the backgrounds of bank personnel. Many out-of-bounds behaviors were eliminated because of legalities; others were simply too hard for the bank to stomach and allow an outsider to do. Unfortunately, these limitations keep the exercise from providing a full representation of what real bad guys could do.

Hacking itself often is illegal and sometimes even considered a felony, so be sure to give the security assessment company written permission to complete the exercise. In the unlikely event that certain activities are discovered, misunderstood and reported, this is the security firm's only way out of trouble. But you can only authorize the team to hack into your own company's systems, not others'.

Any efficient attacker assembles information about the target through public documents, financial reports and technical documentation. Hackers can benefit from information on operating systems in use, major products used in the corporate enterprise, phone exchanges and physical addresses of data and phone centers. BABank handed this information over to our assessment team to save time and money.

Naturally, a real attacker would do anything possible to get closer to his target, regardless of the nature of the business. Fallsworth gave us a legitimate bank account with $1,000 in it. We could access the account by telephone or via a pilot Web banking site that a small number of employees could access.

Find the Achilles' heel

Once the preliminary research is complete, the attack team begins to map the target network. This nonintrusive picture of the target's electronic perimeter includes IP addresses, physical locations, maintenance and dial-up ports, telephone numbers, voice response units, SNA networks, servers supporting Microsoft Corp.'s Routing and Remote Access Service, routers and other remote authentication pathways.

Several commonly available analysis methods and tools aid the external mapping process. For example, a search of InterNIC yields an in-depth look at a company's IP structure. Programs called demon dialers scan tens of thousands of telephone numbers in search of modem tones to indicate the presence of a computer. Network sniffers are used to read traffic along the company's known IP paths; once hackers are inside the network, they

HOW TO GET GOOD RESULTS

Follow these these tips for working with a security assessment team:

- **Choose a consultant who has ample insurance.**
- **Make sure the firm maintains complete and accurate audit logs throughout the process.**
- **Ask the team to create a "shut-off" valve so testing can stop within a minute's notice in case something goes wrong.**
- **Request reports tailored to multiple audiences: technical, middle management and executive board level.**
- **Listen to the results.**

Go online for more information about assessing your network security and correcting vulnerabilities.

can use sniffers to monitor traffic, passwords or other activities at the root level.

It's critical for the security assessment team to log auditible events throughout the process. If something goes wrong and a system is adversely affected, an activity log is instrumental in understanding what went wrong and how to fix it.

Another mapping step is to manually examine the target's IP range — that is, the Class B or Class C service dedicated to the company — through InterNIC and other facilities.

For example, we used the nslookup command to find IP addresses that could be viable targets for our attacks. We then used telnet to lead us to a Unix machine running Sendmail 5.x, which has a number of security holes that might let us penetrate the mail server.

In BABank's case, we also discovered that a systems operator hadn't been online for 19 days, which looked like lax security. We found two people online and decided to wait to launch our attack until they were gone. We also used software to hide our true IP address and identity.

We used Internet Security Systems, Inc.'s Internet Scanner and the public domain Satan security assessment tools to begin finding and exploiting more weaknesses. You also may wish to consider using other tools, such as Netect, Inc.'s Netective, Secure Networks, Inc.'s Ballista and Wheel Group Corp.'s NetSonar, many of which are available as free downloads. Because each product has different strengths and weaknesses, it's wise to stock your arsenal with several different tools to cover your bases. The tools can help find poorly configured servers, routers with holes, Windows NT registry problems, misconfigured operating systems, protocol spoofing, poor passwords, improper upgrades and outdated patches.

SECURITY ALERT:

The number of macroviruses spread from 40 in 1996 to more than 1,300 by November 1997, according to the National Computer Security Association. A Gartner Group, Inc. study predicts viruses will account for 60% of all security incidents in 1998.

SECURITY ALERT:

A U.S. Department of Defense study shows that 88% of the 20,000+ friendly penetration tests the government conducted against its own systems were successful. Of the successful attacks, only 5% were detected. Of those detected, only 5% were reported. Therefore, there were 400 more successful attacks for every one we know about.

In the meantime, we also tried some social engineering. Posing as an engineer who worked for a vendor, one of our employees called BABank's engineering and development group several times and learned about the institution's internal connectivity. We also learned a lot of personal information about one of the bank's workers, and then one of us posed as him to gain additional access to electronic resources.

Armed with the scanner results, the competitive intelligence we gleaned from public sources and the information we got via social engineering, we were ready to penetrate BABank's networks. Naturally, the actual break-in is the most sensitive part of any security assessment, and teams need to be careful not to cause any damage. Don't try this at home unless you know what you're doing — it takes far more expertise to conduct a safe and successful penetration than merely running a scanning tool and generating a report.

Breaking in

Our strategies included using weak passwords, finding old versions of send-mail programs with well-known weaknesses that weren't patched, telneting to unsecured ports, FTPing and modifying password files. This may sound overly simple, but most security holes result from a failure to continually employ common-sense practices.

TCP/IP services, maintenance ports on internal computers and PBXs linked to data lines all provide entrances to the corporate infrastructure along with the means identified in the mapping exercise.

We found two easy entry points to BABank's network. A dial-up maintenance port on an AS/400 used the manufacturer's default passwords, giving us complete control over the system. And the e-mail server used an old version of Unix that hadn't been patched very well. We found several holes there, including a classic send-mail and the ability to write files at the root level. The vulnerabilities let us gain control of the server and communicate with other servers at the administration level.

The next step was to map the internal infrastructure. We used password-crackers to identify weaknesses and found poor controls on application resources, system controls, system utilities and operating systems controls at the kernel or root.

Look at this example of a potential vulnerability: Say an external TCP/IP path connects to a company's Windows NT Box 1, one of eight NT servers. The only connection that NT Boxes 2 through 8 have to the outside world is through Box 1. Therefore, Box 1 is the only available path to penetrating the rest of the enterprise. Administrators often assume that their systems are secure if they offer strong protection on their external security mechanisms. Thus, they implement internal security in a much less rigorous manner, which makes our hacking jobs much easier.

Calling all intruders

Don't forget to assess the security of your corporate PBX, which may have undocumented connections to the data network and could give intruders a way in. But fortunately for BABank, we didn't have much luck getting in that door.

Penetrating a PBX or voice response unit yields an abundance of useful information, such as access points, direct inward service administration and maintenance ports, internal voice recognition

See **Securing the enterprise,** *page 40*

Ten low-cost ways to strengthen your internal security

1. You may need to know more about prospective employees than what they write on their job application forms, especially for mission-critical jobs such as network administration. Consider using psychological profiling to learn about candidates' ethics, morals, tendencies and proclivities.

2. Consider removing disk drives from employees' PCs, which makes it harder for them to install personal software and games, infect your system with viruses and take home proprietary information. This will curtail another potential security problem — loose disks strewn on desks.

3. Don't allow more than one user ID per machine. Deploy secure screen savers to help minimize administrative problems.

4. Confine root privileges to those administrators who really need it. Every root privilege you provide is just another weakness to be exploited.

5. Shred or burn the important stuff: personnel lists, employee IDs, human resources information, customer files, memos, manuals, network drawings and anything else of potential value to an outsider.

6. Keep your garbage inside your building where you can maintain control over its access. Outdoor storage invites dumpster diving.

7. Make your staff cooperative partners in your security endeavors, not resistant adversaries. Try participatory programs such as rewarding employees who find security problems or discover miscreant behavior.

8. Carefully evaluate a security product and make sure it does what the vendor advertises. See what other security enhancements you can make before adding technology that needs care, feeding and management.

9. Empower someone to take quick action in a security emergency, whether it involves shutting down a Web site or calling building security to remove a disgruntled employee.

10. Let your staff know that you use advanced monitoring and audit controls on the network. Explain that the tools are to catch the bad guys and not play Big Brother. This will still make workers fearful of being caught breaking your systems usage and security rules.

— Winn Schwartau

Whatever you decide to call it, the shift from proprietary UNIX workstations to industry-standard Compaq Professional Workstations has been remarkable. Only 15 months after entering the market, we shipped our 100,000th workstation. A feat that took Silicon Graphics eight years to accomplish and Sun Microsystems six years. Our full range of Compaq Professional Workstations is optimized to run the most demanding business, technical and creative applications thanks to our platform partnerships with leading subsystem providers like Microsoft and Intel. These workstations are designed with our innovative Highly Parallel System Architecture, which delivers 1.07GB/s of application memory bandwidth. This industry-standard architecture gives you performance you never thought possible from a Windows NT® system and allows your users to run demanding applications without compromise. You will get a longer lifecycle when you repurpose these workstations for other business use. Plus the same level of serviceability, manageability, quality and reliability you've come to expect from our server and PC products. Would you expect less from the world's leading provider of computers? Visit us at www.compaq.com/products/workstations.

COMPAQ

SOLD IN THE FIRST
TREND OR A STAMPEDE?

Continued from page 37

applications and PBX voice mail forwarding services. This data ultimately helps hackers penetrate accounts and control systems.

To keep hackers out of your PBX, change the default passwords and examine your audit logs to get a sense of normal activity. Verify updates and system patches so you don't add new vulnerabilities. It's also critical to scan for unwanted modems. Remember, all it takes is an unwitting secret modem and a PC set to Remote Server Mode and your entire network opens up.

We used a demon dialer to find a small number of modems within the bank's range of phone extensions. We launched an attack and examined the security mechanisms in place. Several were password-protected so we launched automatic password-guessing schemes to see how weak or strong they were. Although we didn't find an access point there, we were able to mount a manual attack using easily guessed passwords on a router's maintenance port. Bingo!

The port let us enter the network and use the AS/400 to transfer a small amount of money into our account from an account that didn't belong to us. If we could move $1,000, real hackers could move $1 million or $1 billion. However, we knew BABank had a lower threshold for financial fraud detection thanks to our social engineering results.

By penetrating the AS/400, we also gained access to the mainframes and began to penetrate the Resource Access Control Facility security system. But because we already had compromised the Web-based systems, BABank halted the security assessment exercise.

We had won as usual, but there was more work to

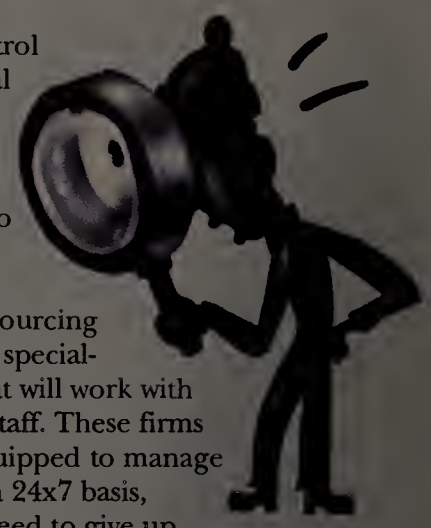
Five basic security necessities

1. Corporate policy tops the list of fundamental internal and external security practices. Think about your security practices and goals, formulate a policy and put it in clear writing.

2. Regularly conduct employee education and awareness training to keep employees updated on all aspects of company security and how they can be a part of it.

3. Engage in periodic security testing and assessment to evaluate how your perimeter and internal security stack up against your policy. Make sure you use consultants who take a structured approach and lack a vested interest in the outcome of the project.

4. Don't forget about the simple aspects of physical security. Control access to electrical closets, servers, telephone rooms and wiring hubs as much as you do to data centers.

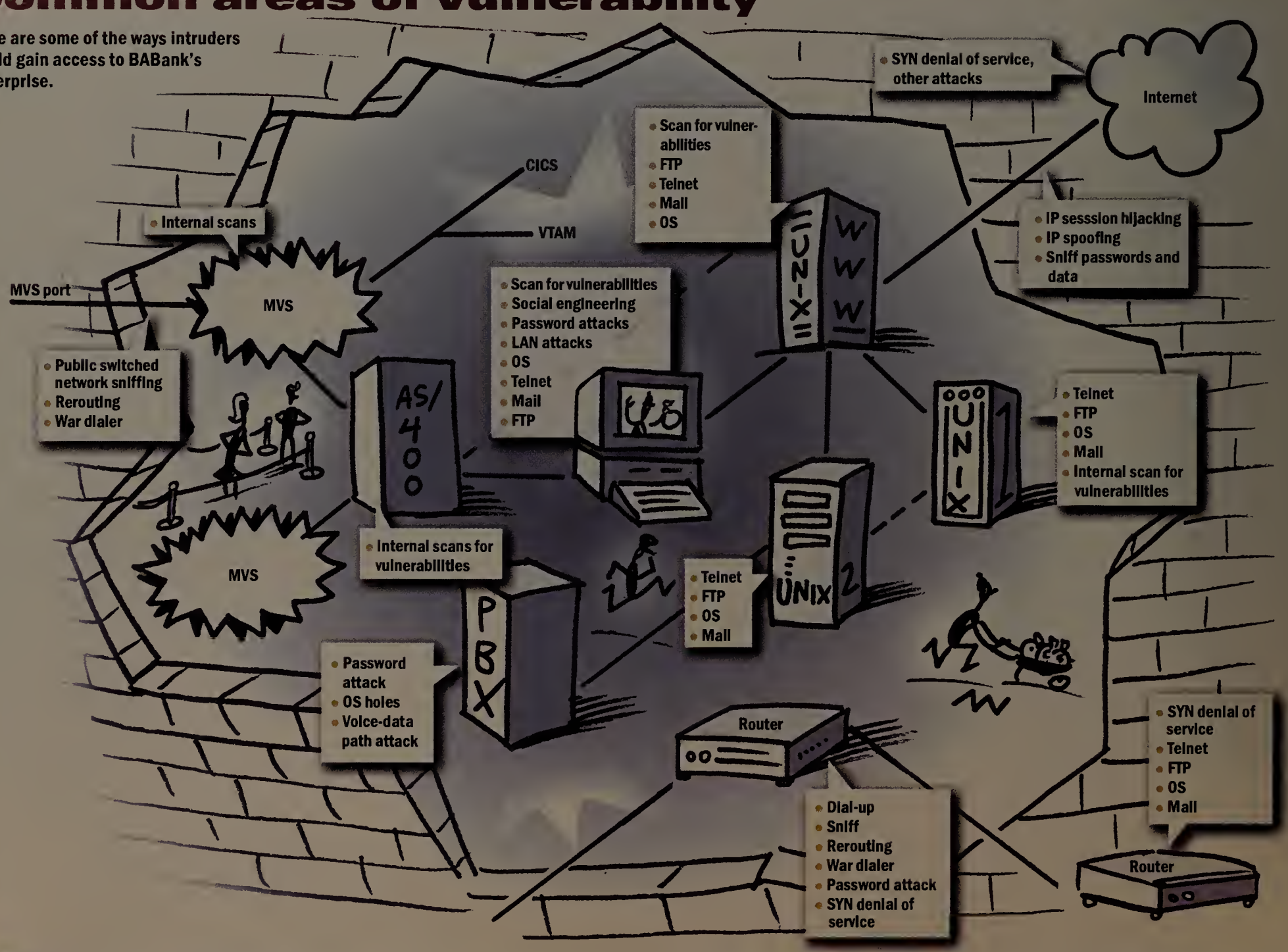


5. Consider outsourcing your security to a specialized company that will work with your existing IT staff. These firms may be better equipped to manage your security on a 24x7 basis, although you'll need to give up some control over a portion of your business.

— Winn Schwartau

Common areas of vulnerability

Here are some of the ways intruders could gain access to BABank's enterprise.



do. We recommended policies, procedures, methods and technologies to solve security problems.

For example, we helped the bank institute a Web security policy and method for monitoring newly discovered weaknesses and vulnerabilities. We also worked with BABank to relate different password-access systems and encourage better password choices. We advised the bank's IS staff to upgrade some operating systems and migrate a few systems from Unix to Windows NT because certain applications run more cleanly on NT.

SECURITY ALERT:

In a Warroom Research study in cooperation with the U.S. Senate, 58% of surveyed companies had detected unauthorized access to their networks. More than 69% of successful intrusions cost the victim in excess of $50,000, while more than 27% cost companies over $500,000.

The most important change was to isolate some services onto separate servers to improve security. Loading services such as File Transfer Protocol or Web server hosting onto a single box compromises security.

However, Fallsworth wisely recognized that these steps weren't quite enough to protect the bank. Although we shored up the network confidentiality, integrity and access control, we still needed to address another key aspect of information security — availability.

BABank was going online to use the Internet as a source of revenue, profit and customer confidence. The site had to be running 24x7. If hackers attacked the site and the services were no longer available to customers, BABank undoubtedly would suffer on the financial and public relations fronts. What's more, site graffiti can quickly mar the public's perception of your company's image, products and services, particularly when the electronic etchings are pornographic.

Our team decided to see how easy it would be to launch a denial-of-service attack against BABank's Web site. We used extensive custom tools because little else was available. Although some hacker-developed denial-of-service programs are available on the Internet, they require lots of tweaking to be effective.

We made the bank network choke by using mail-bombs; SYN flooding, a type of synchronization packet overload; and the ping of death, which is a nasty ping attack that makes certain servers crash. Make sure your security assessment team conducts denial-of-service attacks with you because the target systems are likely to completely fail. You also should evaluate how long it takes to restore operations.

SECURITY ALERT:

A Warroom Research study found that 51% of companies caught more than six insiders abusing their networks. In more than 75% of these cases, oral or written admonishment was the only management response.

It's never over

Once the hired help has broken into your systems, your work has just begun. Above all, don't assume that your networks are secure because they were tested. A security assessment such as BABank's describes the condition of a network at the moment it was evaluated. Just like the rest of your corporate infrastructure, security is a dynamic condition that requires constant vigilance (see story above).

Use the first comprehensive test of your network as a benchmark and continue to sponsor periodic reviews of the system. Just as important, test your new systems before they go online — not after you suffer the consequences.

Remember the credo, "Do unto your systems before someone does unto you." In the meantime, good hacking!

Schwartau is the chief operating officer of The Security Experts, Inc., a global security consulting firm, and president of infowar.com. He can be contacted at winn@infowar.com.

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Netect
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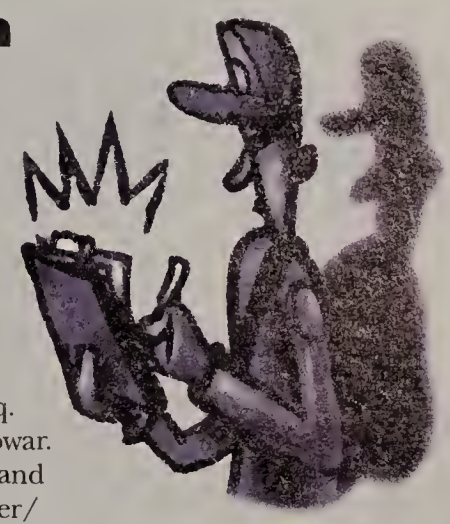
The Wheel Group

Ten ways to maintain security vigilance



1. Test your systems repeatedly to keep up with evolving systems, networks and changes in staff behavior. Consider spot-checking aspects of your enterprise monthly, examine the security impact of new applications before you deploy them and perform an enterprisewide security analysis at least once per year.

2. Re-evaluate your passwords for user identification even if they appear to be working. Long passwords are better than short ones because they're harder to crack, but these also are harder for users to remember without writing them down. Look at these examples of stronger passwords: PaSsWoRd (alternating capital letters); ford6632 (common word with an easy to recall number) or 3lite, wr1t3m3, w1nn13 (hacker-style spelling).

3. Regulate and control your employees' Internet access and usage.

4. As part of your continuing education and awareness program, consider using custom and packaged games and simulations to help your staff experience the effects of negligent security practices.

5. Compartmentalize your internal organizations and departments through the use of access control mechanisms and intranets. Information and resource isolation increases security. Also consider using a secure e-mail system that only lets certain employees contact each other.

6. Subscribe to security-related Internet resources such as security advisories and search key Web sites to stay current. Useful URLs include listservnetspace.org, www.ntbugtraq.com, www.infowar.com/hackers and www.techbroker/happyhacker.hmtl.

7. Promptly install and use every operating system, application patch and service kit the vendor releases. Double-check to ensure the new software doesn't negatively effect other systems.

8. Create a group within your company that functions like the Computer Emergency Response Team (CERT), which has become a general term for a group of experts who lead the company through catastrophic computer and network problems. Coordinate with CERTs from your industry around the world to maintain global vigilance.

9. Update and review users' rights in the access control lists. Review and limit access on a periodic basis to keep security controls screwed down tight.

10. Treat security as a process instead of a product. Security implementation isn't a single milestone to check off on a Gant chart and be done with. Develop an internal security process that reflects your changing business needs.

REVIEW

MEDIAONE EXPRESS' CABLE MODEM AND SERVICE PACKAGE LEAVES MODEMS AND ISDN IN THE DUST.

Cable TV: Speedway to the Internet

By Lee Schlesinger

Once they get a taste of accessing the Internet via cable modem, it'll be hard to get your telecommuters and small-office workers excited about 56K bit/sec modems or ISDN. At the same time, you'll be happy with the price of Internet via cable modem service.

That's our take after months of testing MediaOne, Inc.'s MediaOne Express, one of the first commercially available cable Internet offerings. For $49.95 per month, we got a Bay Networks, Inc. LANcity LCPET-2 cable modem and a shared 1.5M bit/sec connection to the Internet.

MediaOne Express is a deal, considering that a basic analog phone line can run you $20 to $25 per month and an account with an Internet service provider adds another $15 to $20.

While the service is a marked improvement over competing Internet access offerings, it's not quite as fast as a T-1 link. That's because, in a manner similar to Ethernet, you're sharing bandwidth with as many as 500 of your neighbors, the maximum number of users MediaOne will put on a single segment.

On the other hand, unlike a typical modem or ISDN terminal adapter, the cable modem is always on and service is nearly always available. Our link appeared to be reasonably solid; there was only one time in five months of testing that it was unavailable when we tried to use it, and that was because a car hit a telephone pole on the other side of town. We lost connectivity for about three hours while the local telephone company patched things up. That points out a problem with cable: You're dead in the water if the line goes down. With the telephone network, carriers can often reroute traffic around outages.

That said, the service's main benefit is its speed. Your requests for data are sent to Internet servers at 300K bit/sec, but information is downloaded at 1.5M bit/sec, or about 50 times faster than a typical 28.8K bit/sec modem. That may sound speedy, but it doesn't begin to hit the limits of what the cable system's pipeline can deliver.

In fact, tests done when MediaOne was developing the service showed the company could deliver up to 10M bit/sec to customers. However, the cable company limited the speed to 1.5M bit/sec because tests showed normal shared network contention at the 10M bit/sec rate reduced throughput, says Rick Jenkinson, director of communications for MediaOne in the Northeast. Although it doesn't eliminate contention, the lower speed has proved adequate for early customers, Jenkinson says.

In our tests, we got throughput of between 1M and 1.3M bit/sec when downloading an 18M-byte file via the File Transfer Protocol (FTP). We also downloaded a list of 15,000 newsgroup names to Forte, Inc.'s Agent newsreader in just eight seconds — an operation that would have taken minutes with an ordinary modem.

We had less success with video and voice applications such as White Pine Software, Inc.'s Enhanced CU-SeeMe and VocalTec Communications, Ltd.'s Internet Phone. We found voice quality wasn't appreciably better than it was when using a 28.8K bit/sec modem link. Furthermore, video still was extremely jerky, with refresh rates slower than one frame per second. This shows that regardless of download speed, multimedia performance is constrained by other factors, such as the coding and decoding done in the application software.

MediaOne currently prohibits you from using the service to host a Web or FTP server, although Jenkinson expects the firm will allow Web hosting perhaps as early as this month. You're also limited to a single PC per cable modem, though this is a licensing issue rather than a technical one.

Installation couldn't be easier because it's done by MediaOne technicians. At our site, one technician checked the wiring while another provisioned the service by dialing into a MediaOne server over a regular phone line. Provisioning information includes the speed of the link and requires the installer to specify the media access control address of the cable modem and the PC's Ethernet adapter.

Once it's installed, you never have to reconfigure the cable modem. That's a good thing because there's virtually no documentation outside of a glossy promotional folder. However, you've got to be careful not to mount sensitive data on your PC as shareable across the cable network. Otherwise everyone on your segment can access it (*NW*, Dec. 22, 1997, page 1).

We expect that as MediaOne grows more comfortable with the provisioning process it will package an installation program with the modem and let customers handle the task themselves. Most users should have no trouble with this.

After installation, technical support is available via a toll-free number every day from 8 a.m. to midnight. Online help via e-mail or the World Wide Web also is available.

Cable modem access to the Internet is still in its infancy. If MediaOne can increase its coverage areas, and other providers pitch in with services as good as MediaOne Express, this is the way you're going to want your telecommuters and small office employees to surf. ■

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Go online for:

- **A FAQ on broadband access**
- **A list of MediaOne service areas**
- **A pointer to a Usenet cable modem group**

Score Card

MediaOne Express/ LANcity LCPET-2

Performance (50%)	9 x .50 = 4.5
Stability (30%)	9 x .30 = 2.7
Installation (10%)	10 x .10 = 1.0
Documentation (10%)	3 x .10 = 0.3
Overall score	8.5

Individual category scores are based on a scale of 1–10. **Percentages** are the weight given each category in determining the **total score.**

Net Results

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PROS
- ▲ Speedy Internet access
- ▲ Highly stable connection

CONS
- ▼ Web hosting not yet available
- ▼ Limited geographic availability

How We Did It

We connected our 133-MHz Pentium-based PC with 64M bytes of memory via a 3Com Corp. 3C590 Ethernet adapter to a Bay Networks, Inc. LANcity LCPET-2 cable modem, which connected us to MediaOne's cable TV network. To measure performance, we sent and received e-mail, transferred large compressed files, browsed the World Wide Web and read Usenet newsgroups.

This is not your father's MBA

George Mason University's technology management program gives IT workers team-building, project management and leadership skills.

By Loretta Prencipe

What did you do last weekend?

Since January 1997, Saturdays from 9 a.m. to 4 p.m. have meant back to school for Lon Hagerup, a network engineer at research and engineering firm Science Applications International Corp., in Vienna, Va. Throw in the occasional Friday night class, weekly team meetings, classwork and presentations, term papers and finals, wife and child, weekend Reserve duty and his job, and you might bet good money that he relies heavily on caffeine. "No, strictly decaf," Hagerup insists.

Colin Callahan, on the other hand, confesses to drinking lots of real coffee. Most nights you'll find him studying from 11 p.m. to 2 a.m. Callahan, vice president at the information and engineering technology division at Dyncorp, a management consultancy in Fairfax, Va., found that the wee hours were better spent studying than sleeping.

In June, Hagerup, Callahan and 18 other classmates will be the first class to graduate with a Master of Science degree in technology management from George Mason University, in Fairfax. The 18-month program isn't just another advanced engineering degree — it's more like IT's answer to an M.B.A.

Evan Anderson leads *the class of future managers, including Lon Hagerup (inset).*

PHOTO: STAN BAROUH

Tailoring management basics

With a curriculum geared toward the IT professional services and telecommunications industries, the program trains students to make long-term, strategic business decisions incorporating the IT perspective. The program also helps instill the kind of project management skills employers are clamoring for. Students must complete 36 credit hours in courses such as Technology Assessment, Evaluation and Investment; Research Methodologies; Planning and Control of Projects; and Global IT Management.

Evan Anderson, founding professor of the program, built a consortium of local high-tech companies to help design and implement the curriculum. Consortium members include Bell Atlantic Corp., Electronic Data Systems Corp., PRC, Inc. and Boeing Co. Each student accepted into the program must work for a consortium company willing to foot the $22,000 tab.

Jeanine Mercer, a program manager at Fairfax-based systems integrator and reseller BTG, Inc., successfully vied with six of her colleagues for one of the two spots their employer sponsored. Now upper management is taking more interest in her newly developed managerial skills. "Face time increased in the corporate ranks," Mercer says. Her bosses now include her in long-term projects and strategic goal discussions.

Paper is not the rule of thumb in this cutting-edge IT management program. Outfitted with the laptop computers provided as part of their tuition, students connect to a Windows NT LAN during class. The LAN gives students access to an electronic whiteboard and the World Wide Web.

Tackling issues as a team

Teamwork is just as essential to the program as it is to real-life IT issues. Group presentations are an important component of almost every class. Because each student has a busy schedule, negotiations among team members began from day one just to find a free evening to meet.

Harez Sadozai, a network engineer at Cable & Wireless PLC, in Vienna, Va., says the emphasis on team-building and interpersonal dynamics had an immediate impact on his professional life. "Now it's easier to identify different types of people — character types, issues and how to approach them," he says.

Sadozai used what he learned about team building to get a stalled Cable & Wireless project back on track. The project involved his management team, end users and an outside development team. Rather than going head to head with each group, "I sat down and looked at what were the wins for the developers and end users and [how] to quickly get these together," he says.

But face-to-face team dynamics and management make up just one aspect of the program's emphasis on teams. Mercer's favorite classes on team building and interpersonal dynamics also covered assembling dynamic, virtual teams via e-mail.

Because virtual teams lack face time and in-person feedback, the class found the e-mail topic a hot one. Speaking about the uncertainty caused when the sender doesn't get a reply, Mercer says, "The class joke is now, 'What's the meaning of silence?'"

Although many classmates come from competing companies,"there's a high respect within the group," Callahan says. "We'd love to work with each other." Strategic partnering between classmates is not that far-fetched. As a result of the camaraderie and respect the students hold for each other, Mercer has started discussions with another classmate's company on business teaming.

"My hope and belief is that we have built friendships and professional relationships that will continue to grow and develop," Hagerup says, summing up most students' feelings.

What do the consortium companies expect from these students? Leadership. "A fair number will be presidents and CEOs," Anderson says. That's why the consortium invested in this program and in their employees' futures. It's also why giving up Saturday for 18 months is not a lot to ask for a lifetime of possibility.

Prencipe is an attorney and freelance writer in Springfield, Va. She can be reached at LWPrencipe@ aol.com.

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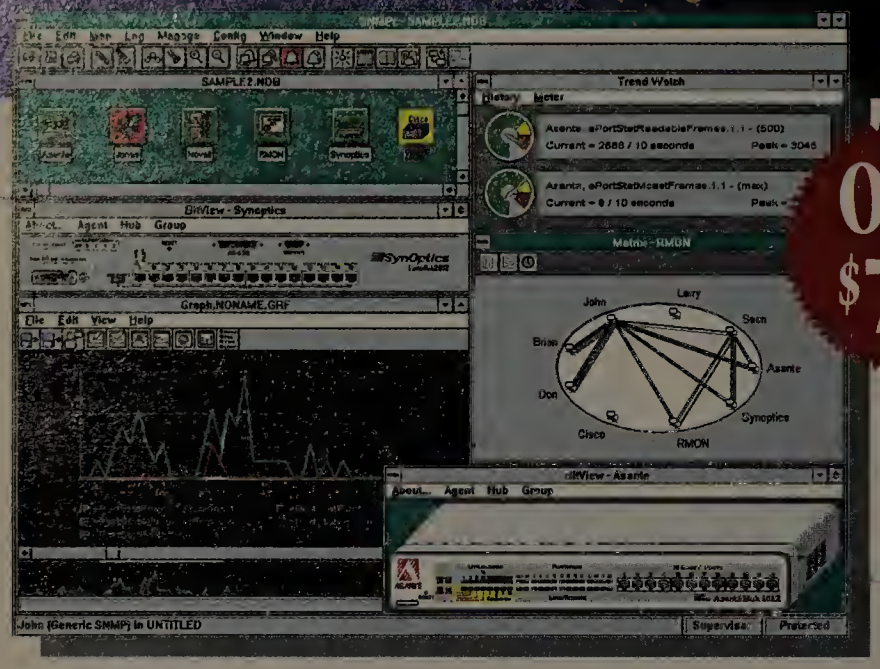

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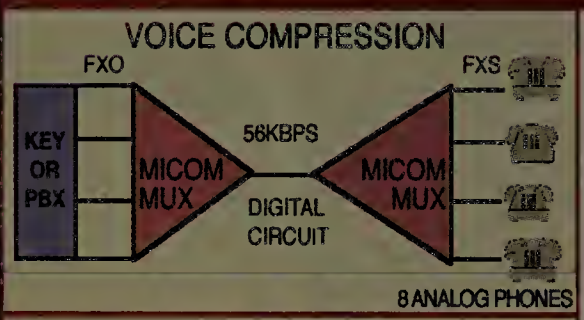

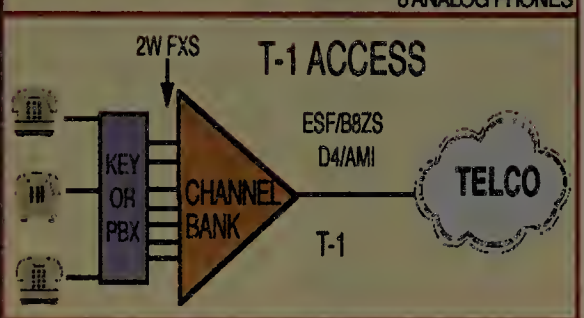

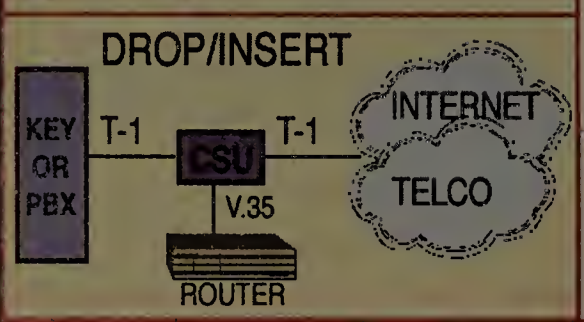

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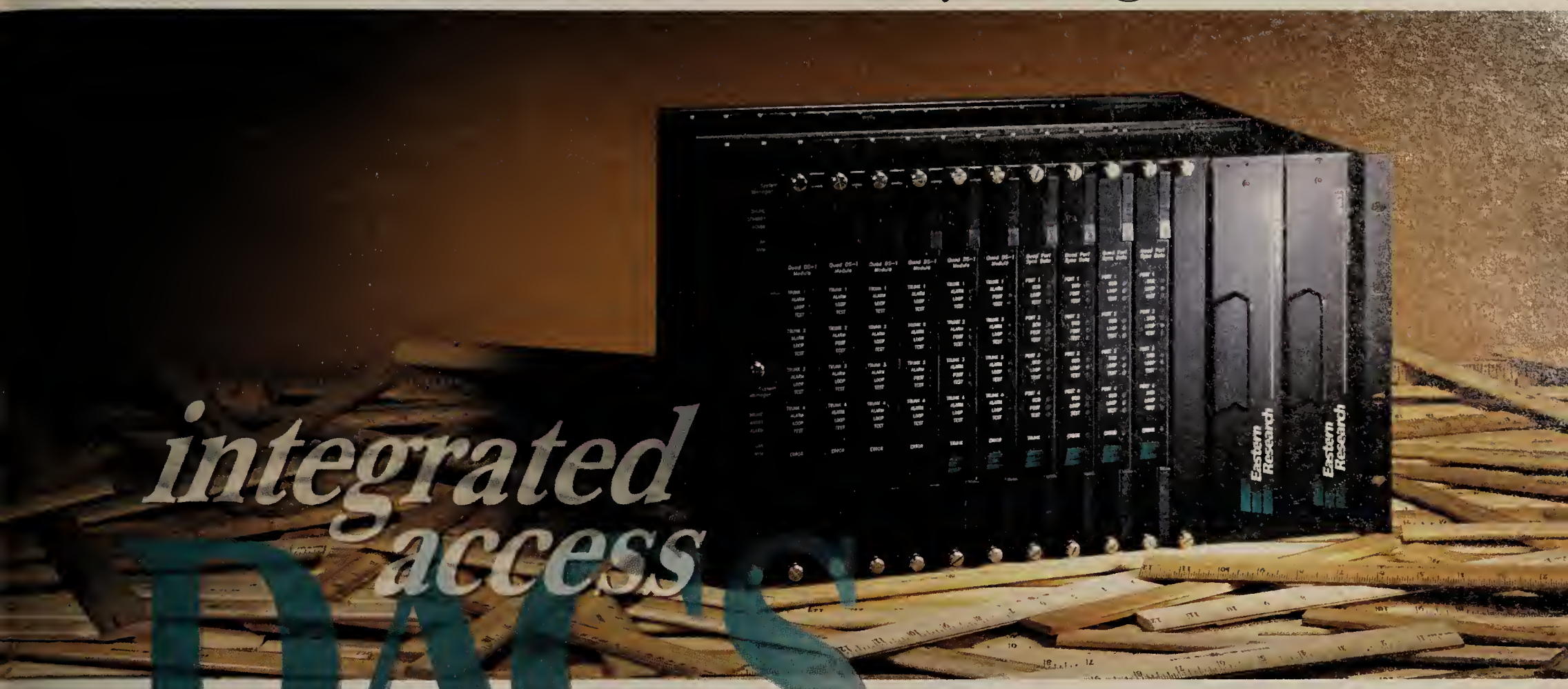

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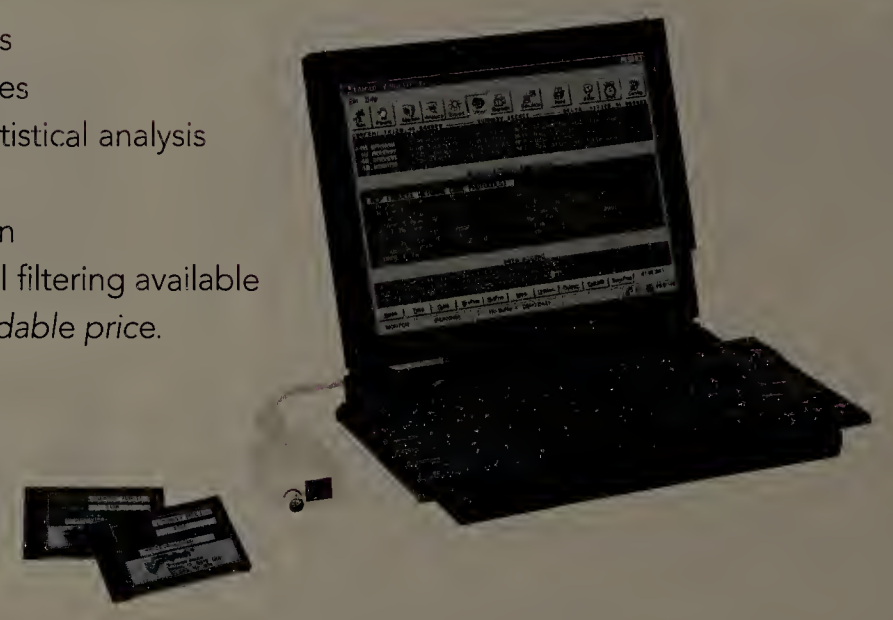

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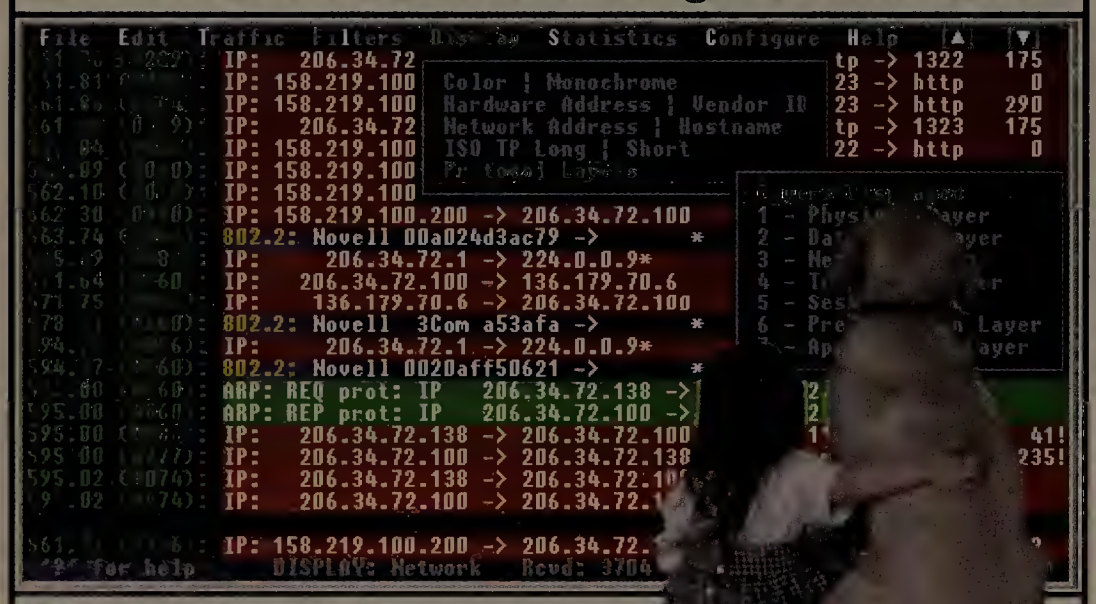

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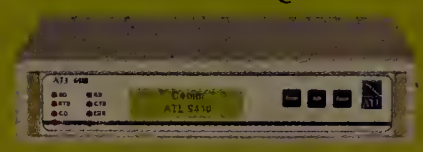

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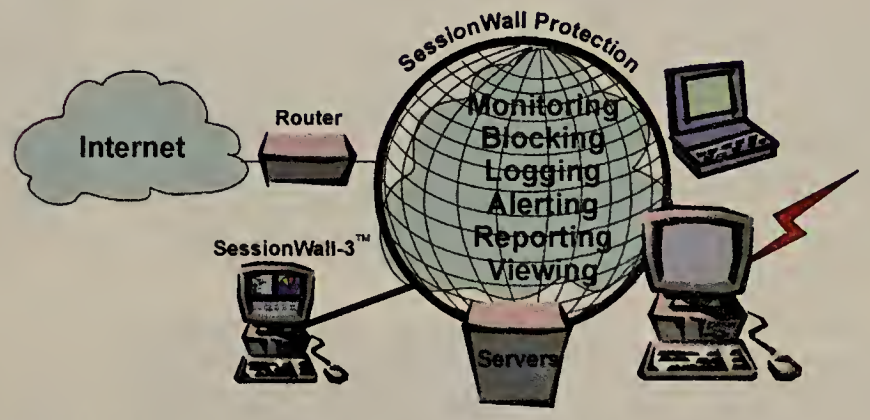

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ComNet

Continued from page 1

Communications Commission's telecommunications policy and passing along jokes about the President's alleged misconduct.

During his keynote address, Bell Atlantic Corp. President Ivan Seidenberg lashed out at the FCC, telling it to get off phone companies' backs so they can offer more data services at lower prices. He said Bell Atlantic would be able to offer technologies such as digital subscriber line (DSL) faster if the company was not shackled by FCC rules designed to regulate voice phone service.

Building better backbones

Because Bell Atlantic is unable to offer long-distance services within its region, the carrier has not invested in building regional backbones for long-distance data services, he said.

Still, Bell Atlantic is not sitting still. During ComNet's annual "Telecom Town Meeting" panel, Bell Atlantic Vice President Jim Cullen said by April his company will be ready to file a request to enter New York's long-distance market. He added that the company has spent several hundred million dollars upgrading its facilities and staff to be able to switch customers to competing carriers. Bell Atlantic now

3Com *shows off its Total Control remote access system.*

fills some 1,000 such requests per day and could handle up to 4,000 per day, which shows the company is fully open to competition on the local loop, Cullen said.

Meanwhile, fellow panelist and former FCC Chairman Richard Wiley blamed the lack of competition in the telecommunications market on interexchange carriers choosing to ignore the less lucrative consumer market in favor of higher margin business services.

Not true, replied Michael Salsbury, executive vice president and general counsel for MCI. He said Bell Atlantic and other regional Bell operating companies use unnaturally high interconnect charges and litigation to keep his company out.

Like a Rolling Stone

"I feel like I am at a Rolling Stones concert watching Mick Jagger sing the same song one more time," Cullen retorted.

3Com Corp. Chairman Eric Benhamou also took a shot at the RBOCs, calling them dinosaurs that could hold up the next generation of networking.

But he acknowledged that conflicting state and federal regulations are holding back the local carriers. Expecting RBOCs to invest heavily in next-generation hardware while giving away access at cost to competitors is an "unnatural process," he said. But RBOCs, sheltered from competition for decades, would not know how to compete, anyway, he said.

Still, the RBOCs showed some vision by launching a consumer-friendly DSL service project in conjunction with Microsoft Corp., Compaq Computer Corp. and Intel Corp. The companies want to make DSL as easy to use as today's analog modems (*NW*, Jan. 26, page 14).

While it is an impressive alliance, the group faces big challenges, including the development of a standard and delivery of modems simple enough for the typical consumer to use. The group hopes to have the standard set by year-end.

Talkin' up IP telephony

Attendees braving the cold rains swirling around the nation's capital last week were showered inside the convention center with voice-over-IP product announcements and demonstrations.

3Com announced a module for its versatile Total Control remote access chassis that enables the chassis to act like a gateway between voice and IP networks.

Competitor Alcatal Data Networks introduced the 1100 QIK Series 800, a concentrator that drops data and voice onto frame relay networks. Later this year, the box will be enhanced to drop voice onto IP networks. A module that will support voice over ATM also is in the cards.

On the services front, AT&T marked its entrance into the voice-over-IP world with its WorldNet Voice market trial, which is slated to get under way in the second quarter. AT&T officials said the service will result in lower voice-call rates, in the neighborhood of 7.5 to 9 cents per minute.

"Bell Atlantic would offer new technologies such as digital subscriber line faster if the company were not shackled by FCC rules."

Ivan Seidenberg, president of Bell Atlantic

MCI also pushed voice-over-IP with its networkMCI Click 'n Connect service. The service will let an Internet surfer click an icon on a Click 'n Connect customer's Web page that could connect the user to a customer service agent over the same telephone line that is linking the user to the 'Net.

Packeteer, Inc. also joined the IP telephony party by announcing that its PacketShaper devices will support standards-based IP voice and video traffic prioritization. Packeteer is upgrading its PacketShaper bandwidth management devices to support the H.323 specification that spells out how to transmit audio and video traffic over IP.

The upgrade will let network managers set priority levels for applications such as Microsoft's NetShow and NetMeeting multimedia applications.

Once PacketShaper detects H.323 voice or video traffic on the network, it suggests appropriate policies to establish a virtual service-level agreement.

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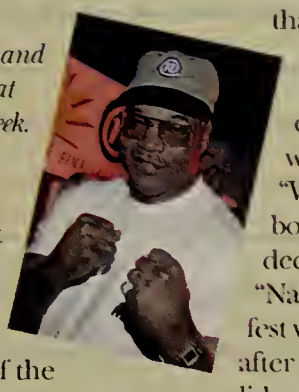
REPORTER'S NOTEBOOK: FROM NAXING TO PICNIC BASKETS

Network World staff

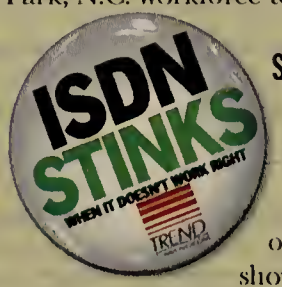
ComNet '98 wasn't all Layer 4 switching and voice-over-IP technology. Here's a look at what show attendees were really talking about last week.



Looking for the perfect employee

According to Nick Francis, president of the Madison Group, Inc. consultancy, trade shows such as ComNet are no longer aimed at selling products to prospective buyers: Some 40% to 60% of the attendees at ComNet are looking for qualified people to come work for them. Recruiting for almost all network industry jobs has become a cutthroat business, he said.

Indeed, Cisco Systems, Inc. had its own recruiting room at the trade show. The room's proximity to the press room — only two doors away — made some folks think the company was imitating Bay Networks, Inc., which recently added a couple of former trade press reporters to its roster of employees. However, when asked about the strategy of hiring ex-journalists or even industry analysts to work on the vendor side, a Cisco recruiter said the company would rather hire people who don't need hand-holding or extensive training. More importantly, another Cisco recruiter said the company is looking to more than double the number of employees in its Research Triangle Park, N.C. workforce to about 2,000.



Say what?

Trend Communications put forth one of the worst marketing attempts at ComNet. It distributed jars of free buttons around the show that read: ISDN STINKS. That's a strange message from a company whose livelihood relies in part on the success of ISDN. Trend makes ISDN testing gear. The fine print on the button read: "When it doesn't work right."

Mama said knock you out

Although NetFax, Inc. had a small booth, the Cambridge, Mass., maker of fax machine add-ons generated some of the biggest crowds at the show, thanks to the presence of former world heavyweight boxing champion Larry Holmes. The Easton Assassin presided over a trivia contest in which attendees were challenged with such stumpers as, "Who was the last person bitten by former boxing champion Mike Tyson?" Holmes declined to brief us on the company's "Nax" technology, but during a schmooze-fest with a couple of trade press reporters after the show closed on Tuesday, Holmes did reveal that he'd like to match up against George Foreman in one last bout.

Foul winds this way blow: Part I

No matter how much network technology was tossed at them last week, ComNet attendees couldn't help but be caught up in the lurid stories swirling around President Bill Clinton. Throughout the Washington Convention Center, CNN TV kiosks blared the days' top stories and people ducked out of parties or meetings early to get an update or grab a glimpse of the President's State of the Union address. National and local news media swarmed local watering holes for showgoers' opinions.

Foul winds this way blow: Part II

Speaking of thunder, the weather in Washington wasn't too pleasant either. A cold rain soaked most showgoers as they ran between the Convention Center, hotels and restaurants, making baseball hats and Rolling Stones leather jackets among the most popular and practical booth giveaway items.

Car not included

TRW Systems Integration Group psyched out most showgoers who thought they might win this hot BMW Z3 sportscar. Turns out the car was for show, but you could win the picnic basket (which is barely visible on the car's trunk) in a raffle. The company was touting new network engineering services.

WBT

Continued from page 1

Microsoft understands the challenge, and its engineers are hard at work on a second beta, which is supposed to show big gains in network efficiency, user response time and intelligent use of the server's resources. Beta 2 is due out by March 31.

"RDP's performance is acceptable over LAN links. But over my ISDN wide-area link to my host, it's pretty painful," said Citrix's Morris

Intended as a pure Microsoft thin-client product, WBT Server consists of a multiuser NT 4.0 server, the RDP and terminal-based client software based on a version of the Windows CE 2.0 operating system. The elements are all supposed to ship by June.

Painful ISDN

RDP's performance is acceptable over LAN links, according to beta tester George Morris, formerly a senior LAN specialist at BCE Mobile, the wireless operating division of Bell Canada Enterprises, Toronto, who recently began working for Citrix. "But over my ISDN wide-area link to my host, it's pretty painful," he said. "You see it especially with the splash screens [the initial graphical image seen in many applications]: They're slow to load up."

A second beta user, who asked not to be identified, said he used the total bytes counter built into the beta software to calculate the maximum traffic between a client PC with the RDP client software and the WBT Server. The peak load was 1 million to 1.5 million bytes over a LAN connection with no other clients. At that rate, a small group of these devices, at least in some cases, could soak up most of a 10M bit/sec Ethernet LAN's bandwidth.

Meet Picasso

Users will have an alternative, if needed. Citrix is beta-testing software called Picasso, which will run on the WBT Server. Picasso lets Windows 3.1 and other client operating systems use Citrix's mature and speedy Independent Computing Architecture (ICA) protocol to access the server applications. The ICA client code can even be loaded on Windows 95 or NT clients if they need optimal performance.

But Microsoft's John Frederiksen, group program manager for WBT Server, said RDP is on track to meet its performance goals. The Beta 2 release of RDP will focus on performance tuning.

"The response times were relatively good in Beta 1," Frederiksen argued. "But we can do significant tuning. We are very, very confident that RDP will be a very efficient protocol."

Based on the initial beta testing, Microsoft wants to make RDP smarter, giving it the capability to know when and how to use information in the local memory cache, instead of reconnecting to the remote server, Frederiksen said.

"The No. 1 thing we're focusing on in Beta 1 is applications support and reliability, meaning: Do the applications run cleanly and does the server stay up?" So far, he said, the answer is "yes."

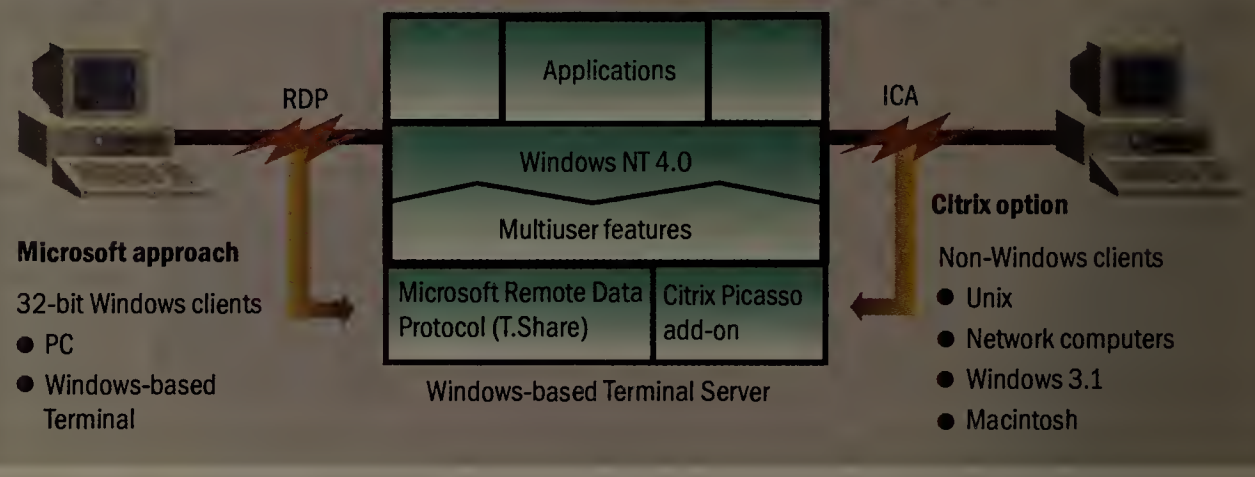
Performance improvements

Testers are a bit less confident. "My understanding is there will be big improvements in RDP performance, but whether it will catch up with ICA is another story," Morris said.

"RDP [also] is lacking a lot of functions and features found in ICA," said Randall Kennedy, senior analyst with Giga Information Group, a Cambridge, Mass., technology research company. With ICA, for example, the server-based application can send files to a printer attached to the desktop terminal or PC. RDP cannot. "ICA has a whole dialog box full of options you can use. But today, to use these with [WBT] Server, you need Picasso," Kennedy said. ■

MICROSOFT'S THIN-CLIENT PLAN

Success hinges on RDP protocol delivering fast response times between terminal and server.



HP

Continued from page 1

interface (GUI) at the ComNet '98 show here last week.

The chief benefit of the read-only Java GUI is its portability, HP said. It will enable network managers to view network topology and events as well as launch Web-based applications from any local or remote machine with any browser that supports Java.

Java provides graphical representation and real-time updates to network changes and events that were not available before.

HP currently ships a textual HTML-based Web interface on NNM 5.0 and previous versions.

The Java GUI, which is in alpha testing now, will ship free of charge with NNM 6.0. It is the third major enhancement to NNM 6.0, which also will include a data warehouse and an HP-developed event correlation engine.

Not impressed

"We looked at [the HTML interface] with Version 4.11 and weren't too impressed," said Bob Donaldson, a systems engineer at Charter Systems, Inc., in West Newton, Mass. "We'd be very interested in seeing [the Java GUI] and learning more about it. The [capacity] for more flexibility is positive."

The NNM Java GUI will feature the HP OpenView Launcher, SNMP Data Exporter, Network Browser and Alarm Browser. The launcher will have a menu that allows users to launch Web-based management applications. It also will include a feature called User Roles, which will allow administrators to filter certain management information to other users based on their management responsibilities.

The data exporter allows users to query the network for data such as traffic routing, address translation, available services on a node and disk space. The Network Browser provides shared access to the NNM topology map and propagates status changes on the management server to all other NNM Web users.

The Alarm Browser works with HP's Event Correlation Services engine, which also is a new feature in NNM 6.0 (*NW*, Dec. 15, 1997, page 6). The browser will let users pinpoint the source of network problems and distribute alarm updates and acknowledgments to other NNM Web users.

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For third-party application developers, HP will provide several Java user interface integration points. They include application registration files for toolbar and menu item integration; Java-based versions of many OpenView APIs; and the ability for developers to provide custom views of objects — such as backplane views of network devices — through Java applets.

Lately, users have been frustrated by the lag time between HP's release of a new version of OpenView and developers' release of applications that can take full advantage of it. And at this point, HP cannot say how many third-party applications will leverage the Java GUI when it ships.

"We don't know how many but we're opening up the APIs and making them as easy as possible for developers to add into this," said Mak Ghangurde, an NNM product manager. "We're talking to as many as we can for beta testing."

"HP is also developing a Java GUI for its IT/Operations systems management software and hopes to release it this summer," said Miika Helynen, HP technical consultant.

HP is not alone in developing Java front ends for NNM and IT/O. Edge Technologies, Inc., a small software developer in Fairfax, Va., rolled out Version 2.0 of its N-Vision GUI at ComNet last week.

Edge has been shipping a Java GUI for NNM since June 1997, and this June plans to unveil a Java front end for IT/O.

HP said Edge was wowed by the HP Java GUI, but Edge said that is not so.

"[N-Vision is] substantially more advanced than what HP [offers]" said Ryan Child, Edge commercial sales manager. "It's alpha code. It doesn't have full functionality. It's a flat file demo. We certainly were not 'wowed.'"

Users may be wowed by the price differential. While HP plans to bundle its Java GUI with NNM and IT/O for free, Edge charges from $15,000 to $75,000 for N-Vision. ■

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Backspin

What if Microsoft sold landscape lighting?

Before I start this week's column, I would like to categorically deny that I have had any kind of intimate relationship with President Clinton whatsoever.

Microsoft recently announced it will not support Windows NT 4.0 running Novell's NDS for NT and that anyone doing so will not be able to upgrade to NT 5.0. Novell came back with a riposte and users are left wondering "What the hell?" once again.

Mark Gibbs

Over the last few weeks I have written many times that the Department of Justice should keep its hands off Microsoft. The company has every right to do as it pleases, including the right to guard its APIs and otherwise fend off any company that threatens its dominance.

Microsoft's unwillingness to open its proprietary APIs has been a particularly hot topic and appears to annoy a lot of people. But the idea that a vendor pushing proprietary interfaces is somehow acting unethically or illegally is ridiculous.

By way of comparison: I have landscape lighting around my house. Most of it was of the type called "architectural grade," which means that it 1) is made of metal; 2) costs 10 times what the plastic version costs; and 3) has halogen bulbs that are nonstandard. Note that last point — each of these tricky bulbs has a special connector with a built-in reflector and costs $12 per throw.

Now it is not as if these bulbs are somehow better or last longer than a standard halogen bulb that costs the princely sum of $2. But to compound the proprietary lock-in, these damn nonstandard bulbs are 20 watts, while the standard for cheap bulbs is 18 watts. It will come as no surprise that I am phasing out the architectural grade.

Just imagine if Microsoft had sold me my landscape lighting . . .

1) 1998 bulbs would be incompatible with 1995 bulbs. 2) 1995 bulbs would be phased out with the release of 1998 bulbs, forcing me to switch to new fittings. 3) Upgrading to 1998 bulbs would require that I also use a 1998 power supply instead of the 1995 power supply and, unless that was a Microsoft-authorized supply, all warranties would be voided.

But I digress . . .

As far as I know, no one is up in arms about the lack of standardization in landscape lighting even though it is a multimillion dollar business. There's also no Justice Department action.

Nope, there's just me and other like-minded homeowners moving over to a more cost-effective solution. Get the point?

Anyway, back to Microsoft and NDS. Now that we've established that it is doing nothing unethical or illegal, what is there to say? Well, actually, quite a lot.

The trouble is that Microsoft is left looking rather childish over this issue. The technical argument it puts forward is not sound, and the refusal to offer any support *at all* for systems running NDS for NT is plain silly. It would be like Microsoft refusing to support Windows NT or 95 just because you installed non-Microsoft applications.

A solution for Novell might be to bite the bullet and say, "If Microsoft won't support you, we will support NT as well as NDS for NT." It would take a lot of guts and be a big risk but the PR payoff would be fantastic.

But I believe it is time to start getting very vocal. We need to tell Microsoft that its position is wrong. What we need is a virtual petition. We need to let Bill know that Microsoft needs to be mature about this. Sure, there's no problem with Microsoft drawing a firm line about the areas where its responsibility ends, but a blanket refusal to deal with NT systems running NDS is unacceptable.

Drop me a line at ms-petition@gibbs.com for the petition form, and we'll see how many names we can collect.

Comments to nwcolumn@gibbs.com or call (800) 622-1108, Ext. 7504.

'Net Buzz

The latest on the Internet/intranet industry

By Chris Nerney

ANOTHER NOTCH IN OUR BELT **Vinton Cerf** doesn't particularly like being called the Father of the Internet.

"I feel rather unnerved when people insist on sticking my name with that label," the **MCI** executive told *'Net Buzz* shortly before we stuck his name with that label. "First of all, **Bob Kahn** is the other half of the team that did the original work. And there are thousands of other people who deserve lots of credit."

But Cerf's paternity is undeniable. It was he and Kahn who developed the TCP/IP computer networking protocol in the early '70s, back when the rest of us were marveling at handheld calculators.

Besides, we've seen the blood tests, and you're it, Vint.

Cerf has been a good father, tirelessly promoting the Internet, going to all of its Little League games and never undermining its self-esteem.

He graciously agreed to a short interview on some Internet-related topics. We don't have enough space to run the full version, so in the journalistic fashion of the day, we've excerpted only those parts that will make him look bad.

'Net Buzz: Does it bother you when people use the word "Web" when they mean "Internet" and vice versa?

Cerf: On purely technical grounds, it means people haven't understood there's more to the 'Net than the Web. On the other hand, the Web certainly has made the Internet more visible than any application it ever had. So who am I to complain?

'Net Buzz: Do you hate it when people refer to **Tim Berners-Lee** — the "Father of the Web" — as the "Father of the Internet?"

Cerf: No, I don't hate that.

'Net Buzz: Care to venture any predictions about what kind of Domain Name System the Internet will end up with?

Cerf: I think in the end we will have a competitive registration system where the same domain name can be registered by multiple parties. It is competition that helps drive costs down and helps improve quality.

'Net Buzz: If you could change anything about the Internet, what would it be?

Cerf: The one thing I would have done is have a bigger address space. I thought at the time, in 1977, when we made the decision, that 4 billion addresses would be enough.

Sorry we had to rough you up, Mr. Cerf. We're only doing our job.

A RICH TALE TOLD THRICE **Narrative Communications Corp.,** a start-up that sells client/server software for delivering multimedia ads on the World Wide Web, has completed a third round of venture financing.

The $5 million funding comes from **Carlyle Venture Partners,** along with original investors **Accel Partners** and **Greylock Management.** Narrative, started in 1995 by former **Lotus Development Corp.** employees, raised $8 million in two previous venture rounds.

The Waltham, Mass.-based company will use the money to ramp up sales and marketing of its flagship Enliven product line.

MONICA LEWINSKY: THE WHOLE STORY Like us, you probably thought you heard every sordid detail of the **Monica Lewinsky** saga reported in the media.

It turns out, however, that in its zeal to sensationalize, the mainstream media have focused solely on the obvious, easy aspects of this scandalous tale.

If that kind of shallow coverage leaves you wanting more, turn to the newsgroups, where the hard questions are being asked. Here's a sampler:

In **alt.support.big-folks** and **soc.support.fat-acceptance** you can join in the debate about whether Monica is a "woman of size." (Hint: Consensus is that she's not, so if you post a contrary opinion, we suggest you don your asbestos.)

Over at **alt.smokers.glamour,** people fervently hope to confirm rumors of Lewinsky's habit. "Would be nice if Monica smoked!" said one poster, breathlessly.

Meanwhile, contributors to **rec.music.opera** ponder what roles the president, Lewinsky, et al. would play in **Victorien Sardou's** *La Tosca.* **Clinton** as Scarpia? The mind races.

'Net Buzz is only interested in your best Internet- and intranet-related news, none of this trashy tabloid stuff. Unless, of course, it would unburden you to tell us. Contact Chris Nerney at (508) 820-7451 or cnerney@nww.com.

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